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# HOW TO MAKE FINE FRAMES

A MANUAL FOR THE ARTIST

by JEAN WOOLSEY

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## FOREWORD

There are two very distinct branches of the picture framing business. One is the framing of reproductions for so-called "popular" consumption. The other is the framing of original works of art. Unfortunately for ART and the artists of America, the former is, by far, the more important from the commercial standpoint—the latter being a mere drop in the bucket compared to the vast quantity of framed pictures that are annually sold from the shelves of the dime stores and the walls of the gift shops. While commercialism may be the basic cause it is not directly the thing that I have reference to as being inimical to the interests of ART. The direct evil is in the **inferior quality** of the articles produced with its consequent stupefaction of the aesthetic mind of the public. Manufacturers will argue that they are only supplying what the public demands. But that is hardly satisfactory as an excuse for glutting the market with the most hideous examples of so-called art. The inferior artistic taste of the American people has become an axiom with almost the entire industry (there are a few admirable exceptions) engaged in the reproduction and framing of pictures. "Giving the public what it wants" is perhaps the easiest way out. But it may also be the easiest way out of business, for the people will, sooner or later, become "fed up"—like a small boy who has been fed copious amounts of candy until his stomach is not fit to digest either candy or beneficial food. There are other and larger industries which are closely associated with some forms of art that apparently believe in the same principle of stultifying the public with their productions. It is not a question of supplying the public with a particular school of art, a particular type of art, or any theory of art; for producers may reasonably differ on hypotheses for the evaluation of art. The fault lies in the wholesale "playing down" to the public—which, in my opinion, shows more stupidity on the part of the producer than the consumer. Basically, this is one of the chief obstacles in the path of the American painter, and its recognition must be included in any comprehensive discussion of the artists' problem. All of which might be irrelevant in a manual whose chief purpose is to teach artists how to make better frames, were it not that I hope my efforts in its preparation will be compensated largely in the satisfaction of knowing that I have been of some assistance in lightening the economic burden of the artist in his fight to develop a more appreciative and consequently more fertile field for his work.

Of all the arts there is none so dependent on a particular craft for its presentation as the art of painting is dependent on frame making. Regardless of how a manuscript is printed and bound, the logic, force, or beauty of the thoughts will be very slightly, if at all, enhanced or impaired. One musical composition can be presented with hundreds of different instruments—from the violin and the voice down to the harmonica and whistling. But an easel painting (and in many cases a mural) must be presented in a **frame**. This being the case, the matter of framing is much more than a purely economic problem for the artist. If the frame plays such a vital part in the presentation of a painting the artist cannot wash his hands when the painting is finished and say he is through. Nor can he turn the picture over to a framer and expect him to spend time and thought and experimentation commensurate with the effort that went into the painting without also expecting to pay handsomely for the work. In which case, moreover, we should also assume that the framer has a fundamental appreciation of art, together with interest, enthusiasm and appreciation of that particular artist's work, equal to that of the artist himself. But if it is problem enough for a painter to supply himself with even the ordinary run of commercial frames it is a far cry to the ideal situation wherein the talents of a single framer are devoted to framing the work of one or, at the most, three or four painters. The answer is clear: The artist must make his own frames—must devote time, study, and labor in proportion to the respect he holds for his painting. When artists no longer consider the frame as a worrisome though necessary incidental to be disposed of as quickly as possible, but give it the consideration it deserves for the vital part it plays in the presentation of the picture,

they will find it expedient to **make** their own frames in order to **know** frames. Thus the "framing problem" will come to mean something quite different than the thought it conveys today. An intimate knowledge of frames and framing will become a requirement in the curriculum of painting. And when this condition prevails among artists generally, out of it, perhaps, will come the ideal situation with frame craftsmen who are more than craftsmen and whose work will be held in high esteem by the art profession.

Hence, the purpose of this manual is to teach artists **how to make** frames. The general theory of framing I leave to the artist to develop. While my experience in framing thousands of pictures has naturally caused me to form ideas on the theoretical side of framing, I am convinced that anything other than broad generalizations (which appear in the text as they occurred to me) along this line would be misleading, for I have learned above all else that set rules cannot apply in framing the work of different artists any more than they can apply in the various methods of painting used by different artists. However, in framing the pictures of an individual painter, it is natural that all of the frames will follow more closely a particular style to fit the general characteristics of his work; but even in this case the extent to which set rules could apply would depend upon the versatility of the artist. And so my efforts have been directed toward the accomplishment of one thing—that of making this manual so thorough that the practical side of frame making will be quickly eliminated as a problem to hinder the full development of ideas. I have carefully detailed the operation on every point which might present itself as a problem to the beginner and have had numerous exacting illustrations made to further clarify these points. At the same time I have attempted to eliminate everything of an irrelevant nature.

The recipes and formulas contained in the book, while occupying only a fraction of its contents, will doubtless appear to the beginner to outweigh in importance the balance of the book. As the work progresses, however, it will be seen that the working methods are of equal if not greater importance in the production of a genuinely fine frame. I hope you will keep this point in mind and not rush too quickly in completing a frame merely because all the essential recipes are at hand. I have always been a scrupulously careful workman and it is this care that is responsible, in my mind, for whatever respect my work holds in the minds of those artists who have used my frames for many years.

Finally, do not become discouraged if you make a botch of a frame or two. Remember that I spent many years in steady work and experimentation, and botched many jobs myself, in acquiring the knowledge that I am giving to you in these few thousand words.

—THE AUTHOR.

**I**T was the original intention to arrange a skeleton outline of the contents of this manual, in order that a sketchy idea of the entire procedure would simplify the approach to the work for the beginner, as well as serve as a reference to specific items or processes. However, the amount of reading matter being comparatively small, it now appears that an outline would serve no particular purpose. The manual therefore should be read through several times before starting work, in order that, during the course of making a frame, when reference to a specific point is necessary, it can be quickly found and readily understood. Also, while it is made up into different departments, there is definite relationship between each department, and an acquaintance with its entire contents—from “EQUIPMENT” on through “SUGGESTIONS”—will allow the beginner to visualize the production of a frame, and thus the first actual work will be greatly simplified. With this as a basis, an easy familiarity with the work should be acquired after the production of two or three frames—and after that, the quality and variety of the product will depend entirely on the skill and effort that goes into it.

The approach to the work might be simplified to some extent by dividing the manual roughly into three sections. The first section pertaining to the raw wood frame and including the four departments, “EQUIPMENT”, “MOULDING”, “CUTTING AND JOINING”, and “CARVING”. The second section being the entire finishing process for a metal leaf frame and including the two departments, “FINISHING” and “TONING”. The third section explaining variations of finishing, other distinct types of gilding, etc.—all based largely on the second section—and including the five departments, “‘SHORT-CUTS’ AND REGILDING OLD FRAMES”, “GENUINE GOLD LEAF GILDING”, “BRONZE POWDER GILDING”, “COMPO ORNAMENTATION”, and “SUGGESTIONS”.

## EQUIPMENT

The actual shop equipment necessary to produce a fine frame can be very meager. The tools and machinery you care to invest in is largely a matter for you to decide. Naturally, a well equipped and neatly arranged shop will make the work much easier and will be an incentive to, if not the cause of, finer productions. The first frames I made were assisted by only the crudest and scarcest collection of tools imaginable—an old discarded kitchen table, two or three carving tools, a crude hand-made miter box, ordinary saw, hammer and nails for joining (without even a vise to hold the pieces while joining), and empty tin cans and glass jars completed the shop.

I will suggest the tables, racks, etc., which are most essential. You may prefer to work out your own plans to suit your particular needs or available space.

If you buy your raw mouldings already joined into frames, very little in the way of tools will be required. In such case a few carving tools and three or four brushes, along with pots, jars, and pans, will be about all that is needed.

The first thing you will want is a large table about four by six feet and about thirty inches in height—built of heavy material (one and one-fourth inch thick boards for the top and two by four inch legs) and solidly constructed. If possible, an additional table will come in handy. Racks on the side of the table for holding hand tools, screws, nails, etc. Shelving along the wall for holding all the materials—perhaps five or six shelves about one by four feet. A rack built overhead or in some out of the way place for holding the raw wood moulding. Then you will want a rack for holding frames while in the process of manufacture. If there are rafters overhead or if the walls are available for the purpose, the simplest arrangement is to drive nails into various points around the walls or on the rafters, allowing the nail to protrude about three-fourths of an inch. The frames may then be hung on the **rabbet** at center, on each of these nails. Other tables, shelves, etc., can be built as the need arises.

As previously suggested, any sort of table that is available will do. I repeat that the planning of a work shop is a matter largely for you to decide. The one large strong table is the most important item and will facilitate the production of frames. This table should be set away from the wall so that you can get at it from all sides. Tools and machinery will be listed as the procedure of making the frames is discussed. The amount and quality of the tools used will also be a matter for you to determine. I suggest that if you do not care to equip your own shop too extensively that you get your equipment together with others. The work will be much easier when aided by the most essential tools.



## MOULDING

Moulding for gilded picture frames should be made from basswood or soft clear white pine, thoroughly seasoned and dried—preferably kiln dried. If pine is used it is especially important that it be kiln dried. The best way to test pine for this use is in judging its weight. A very light weight board indicates not only a well dried piece but also denotes a board free from the hard pitchy grain generally found in pine. Also try to select boards that are very white in color and show no large markings of grain. For the average building purpose this soft, light weight pine is not as desirable as the lumber that has a certain amount of hard grain, because it is not as strong or as durable in resisting the elements. For frame moulding, however, it is necessary, first: because it makes carving much easier; and second (and more important): the water mixture composition which is the base for every type of gilded frame, causes the grain to “lift”, and it is almost impossible, no matter how many coats are applied, to cover up the pattern of this grain—which becomes more apparent when the frame is gilded.

The advantage of basswood is that it has practically no grain, which eliminates this difficulty found in pine. Most mills do not carry basswood, however, so that if pine must be used it should be very carefully selected, keeping in mind the three requisites: white in color, light in weight, and free from grain.

Mills that specialize in moulding manufacture are, of course, the logical places to procure them. Any large modern planing mill can run patterns to your specifications, although unless a large quantity of the same pattern is bought at a time the price is quite high. This is because a large part of the work is in setting up the machines and shaping the knives preparatory to running out the moulding. This original cost is gradually reduced proportionately to the number of feet of one particular pattern that are run at one time. Mouldings are usually made in twelve, fourteen, or sixteen foot lengths and should be laid level on a rack with enough rests to prevent the moulding from sagging, and preferably in a room of fairly even temperature and free from excessive dampness.

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## CUTTING AND JOINING

An inexpensive and very accurate tool for mitering and joining the frames is the miter machine, which is a combination miter saw and vise for joining. Every artist who does his own joining should have one, for it is probably the most essential and practical hand tool made for the joining of frames. This should be mounted on one corner of the heavy work table as illustrated, and, although the machine is constructed so that it may be turned in various positions, it will seldom have to be changed from the position as shown in relation to the table corner (see ‘a’, plate No. 1). Even though you intend to get along with a minimum of tools

I would urge you to make this one of the first, for the balance of tools I may recommend, can be substituted for the sake of economy to much better advantage than this miter machine. It will mean good solid joints with a minimum of labor and worry. After the frame is joined there are all sorts of makeshift tools that can be used without detriment to the quality of the work.

I believe that one of these miter machines including the saw can be purchased for less than \$20.00. For those who intend to do their own cutting and joining, but do not care to invest in one of the machines on the start, a straight miter box with a guide for an ordinary hand saw can be purchased for as little as \$3.00. This type of box will cut accurate enough miters, but there are no clamps and no arrangement for holding the pieces for joining. In this case the joining could be done by marking a right angle on the corner of the table and clamping the two pieces down with C clamps. If this method of joining is used I advise using screws exclusively, as hammering nails would easily knock the corner out of square (see 'b', plate No. 1).

Before mitering your moulding it is always well to sight along it to see whether or not it is warped. If it shows any decided warps or bends the pieces cut therefrom should be planned so that the longer lengths are cut from the straighter part of the moulding and the shorter pieces are taken out of the more curved sections. Whenever there is a decidedly sharp turn or twist in the length of moulding it is best to try and plan your pieces so that a miter cuts directly at this turn in the moulding or so that a small section at that point is cut out. Careful planning will avoid waste in "left-overs" from a length of moulding. To avoid this waste one general rule to follow is to not leave the wider and heavier moulding (principally the heavier moulding, as the wide flat types are often adaptable to small pictures) in too short lengths. For instance, if three pieces have been cut from a heavy moulding and by cutting the fourth piece it will only leave an eight to twelve inch piece, it will probably be advisable to cut this fourth piece from a new length, as the other piece can be cut with less waste for another frame. The "left-overs" in the smaller mouldings will be used up soon enough on small frames for sketches.

When mitering the moulding the usual allowance for a neatly stretched canvas, where the stretcher pieces are not keyed far apart in the corners, is one-fourth inch over the size of the stretcher pieces—that is, the back opening is one-fourth inch larger on both measurements. Thus for an eighteen by twenty-four inch stretcher size, the back opening of the frame should measure eighteen and one-fourth inches by twenty-four and one-fourth inches—and in mitering the four pieces for the frame, two will measure eighteen and one-fourth inches and two will measure twenty-four and one-fourth inches on the rabbet (see 'c', plate No. 1). Most mouldings exceeding one and one-half inch in width are made with a lip about three-eighths of an inch wide. This is a good safe amount for holding canvases that may be out of square or have heavy over-lapping canvas on the corners which, when mitering the frame, would call for more than the usual allowance for fitting. Whenever three-eighths of an inch seems to cover too much of the picture (especially in the case of a painting on a board or panel that is painted clear

up to the edge) the frame can simply be cut with more than the usual one-fourth inch allowance and small strips or blocks inserted in the rabbet to hold the panel from slipping too much to one side or the other.

With the miter machine it is very easy to get just the exact measurement desired. The first mitered end is run up the rule which extends from the machine and when the proper measurement is reached the moulding is clamped in position and the sawing is done (see 'a', plate No. 1). Before mitering it is best to cut the moulding into the lengths required (allowing enough additional length to take care of the two miters—an amount equal to twice the width of the moulding) for the frame job at hand—then miter. This makes the job less cumbersome.

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Now comes the joining. Many frame makers use only glue and nails. If this method is used the only implements required other than the glue and nails are a hammer and a nail set (or even a heavy nail will suffice for this last).

There are various more elaborate methods of joining, such as dowel pins, keyed joints, pieces inset on the back of the frame, etc. All of these methods necessitate a great deal of skilled effort and more tools. The advantages are questionable. The simplest and best method is to use a screw or screws. This method is as simple as driving nails. The advantage is obvious in that the screw pulls the two pieces together and "stays put". For this you will need a drill to bore the hole for the screw, and the screw driver. A hand screw driver will do, though a ratchet brace with a screw driver bit will make the work easier. If you have the ratchet brace the drill bits can be used in it to do the hole boring if you do not have a separate drill holder for this purpose. Or even an ordinary cheap gimlet will do for drilling the holes, though the work will be slower.

Place a long and short piece on the miter machine. (Don't put two short sides or two long sides together—the best framers do it at times!) Bring them together at the corners, being sure that the rabbets of each piece are pushed up against the stops on the joining machine. See that the design matches up where the two pieces join. Pull the clamps up snugly. When the two mitered pieces match up perfectly when they are tight in the vise, then loosen and remove only one—leaving the other piece clamped in the vise—without too much pressure. Now you are ready for the glue.

There are various kinds of joint glue. Glues that require heating come in flakes or chips—gelatin glue, hide glues of various kinds, white flake glue. Most hardware stores handle a good enough grade of joint glue, though I believe that in the hot glues the white flake glue is the best for joining. All of these glues require soaking in cold water from one to five hours or more, depending on the thickness of the flakes or pieces. The dry glue of the amount desired is put in a jar or tin and well covered with water. When it has absorbed a good part of the water and has become soft all through, set the container in another receptacle of hot water. The glue will soon melt into a liquid and can be used as it is or thinned with hot water if necessary. While in use the glue container must be kept in

the hot water. When through with the glue it should be set in a cool place to prevent spoiling. After two or three re-heatings the glue loses its strength and a new batch must be made. The hot glues are now largely replaced in joining work by the cold water casein glue. This glue is much easier to handle because it does not "set up" so quickly when applied to the parts being joined—it occasions none of the bother of long soaking and heating—and when properly mixed is stronger and more durable than the hot glues. The quality brands of this casein glue are put up in small tins with simple directions for mixing which should be carefully followed. Learn to mix as closely as possible to the amount needed as this kind of glue is unfit for use after standing eight or ten hours.

Apply a good thick coat of glue to the piece removed, using a flat stick or small stiff bristle brush. Now set the piece back in the vise and pull the two pieces together with a good pressure.

If only nails are used there should be two driven in from each side if the moulding is thick enough and heavy enough to hold four nails. Smaller mouldings will, of course, take fewer nails and smaller sizes. But even in the smallest moulding where only thin brads can be used there should be one driven from one side and one from the other side. Be sure to use only finishing nails, and when they are driven nearly to the heads take the nail set and drive them about an eighth inch into the wood. Some four penny, six penny, eights, tens, and twelves will be sizes enough, along with some one-half and seven-eighths inch brads.

One screw for a corner will usually be sufficient along with one or two nails, though in very wide or heavy mouldings two may be advisable. These should be long thin screws rather than short heavy types. Drill a hole into the corner (the drill should be a little smaller in thickness than the screw) in the direction for the screw to follow, stopping a little short of where the end of the screw will reach. Dig out with a small carving tool or reamer a socket for the head of the screw to be imbedded in. Set the screw into the hole with a hammer and then pull it up tight with the screw driver until the screw head is pulled well into the wood. One important thing to remember is this: set the screw well up to the top of the moulding and in as close as possible to the rabbet. This is because any cracking that ever occurs on a frame corner seems invariably to be on the top inside. Remember this and you will have little occasion to worry about cracked corners. Wide flat mouldings are more apt to crack than the narrower thick types. For this reason these wide flat mouldings should have very accurate miters as this will help prevent cracking. (see 'd', plate No. 1).

Follow the same procedure on the other corners. Having the sides of the miter machine paralleling the sides of the table corner will bring the frame as it is joined over the table. Place rests under the frame until the joining is completed in order that the un-attached sides will not sag and weaken the corners before the glue is dry. In doing this, sight across the piece that is clamped in the vise to the opposite side, and place the rests so that the opposite sides are level or parallel as the joining proceeds. At times the last joint will not fit up true—gaping at the top or bottom or on the inside or the outside of the corner. At such times the miter machine is invaluable for trueing up the joint. Set the two pieces in the vise, matching the design as closely as possible, and set the clamps firmly. Then place the saw on the machine and cut thru the cor-

ner. If the fit is off a great deal this procedure may be gone through a second time. The result is that the corner will fit together as snugly as the others, although the design may not match perfectly. This will of course change the measurement a little, but too slightly to cause any trouble. When the joining is finished wipe off the surplus glue before it sets.

Here is a suggestion before we leave off the joining. As previously suggested, the sides will be supported with rests as the joining proceeds. When the second joint is being made, sight the two opposite sides and place the rest so as to bring the two as nearly level as possible before tightening the clamps. Now when this second joint is finished, take the three sided frame out of the vise and (holding it so that the loose ends point straight up to prevent sagging) again sight to see if the opposite sides are parallel (see 'a', plate No. 2). If A and C are parallel after the first two corners are joined, then B and D should also be set parallel for making the third joint. But if the loose end of A is higher than the loose end of C, then when the third corner is being joined, A B C should be rested so that B falls below the loose end of D. (Or vice versa as the case may be). Then when the last joint is made it should pull the frame level all around.

In closing this department I again want to impress you with the great service to be had from this combination mitering and joining machine, provided you are doing your own joining. Any good carpenter shop should be able to do this joining for a small charge, but the difficulty here lies in the fact that not many will realize the importance of perfectly solid joints in gilded frames and will not be quite as careful as the person who has a knowledge of the finishing and gilding to follow.

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## CARVING

Here is a subject that might make up a volume or more in itself. For practical purposes it will be comparatively brief in this manual—for several reasons. I feel that wood carving is a subject or profession much the same as painting but without the wide scope. It is largely employed as a craft but verges on, and at times goes directly into, the fine arts. As a consequence, a voluminous treatise on the subject would be of use or interest only to one whose profession is wood carving. Furthermore, frames for contemporary paintings require either a maximum or a minimum of ornamentation. Most of the highly ornamented frames of high quality, for many years back have been of compo.

Not to be confused with the fragile plaster ornaments, Compo is a mixture of whiting, glue, oil, pitch, resin, and other ingredients. The designs are originally carved in wood and duplicates are made by pressing the compo into forms. The pieces thus made become rock hard when dry, but are easily applied to wood mouldings by steaming. The labor and equipment required in making compo is too difficult for the one-man shop, but these ornaments can be bought from firms specializing in such work.

It is true that many of the cheapest frames make use of this type of ornamentation. Yet again, many of the finest antique frames were made in this manner. The antique effects, much in vogue today, require

this elaborate ornamentation not only to duplicate the old designs but to get the spotted or broken effect when the gold is rubbed down to the base.

On the other hand, the very simplest types of moulding with a minimum of ornamentation are just as appropriate, if not more so, than the "antique" types. I believe that the vogue for the antique frame is or has been quite a lot over-done. Many artists ruin the effectiveness of a good picture with a perfectly atrocious conglomeration of elaboration, white paint, worm holes and fly specks. However, there are some paintings that require the softness and lack of precision to be found in a good job of "antique-ing". You should remember that just as each picture is an individual expression, so proportionately individual thought and effort is essential in the proper framing of each picture.

Well designed mouldings often require only a small amount of tooling (working over the entire moulding or particular segments, using the shallow gouges or the flat chisel) with no carved corner designs. This is not for the purpose of merely having a "hand carved" frame, for it serves a more legitimate purpose in softening or breaking up a surface or a line that is often too harsh and precise against most pictures. On the other hand there are some pictures that are better framed in severe straight mouldings. It is also true that many carvers spoil good mouldings with too obvious and regular gouging, and this should be studiously avoided. "Poor taste" can be shown as easily with a carving tool as it is so obviously displayed in the elaborate compo ornamentation on much of the furniture of this day.

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Six or seven tools will be sufficient for doing a wide variety of carving. The illustration suggests those that will be of most general use. (see 'b', plate No. 2). It is best to become acquainted with a few tools first and add to them as the work becomes more familiar.

Good steel is often found in the "amateur" tools but the price is very little more for the professional tools and the quality will be more consistent. Cheap tools may sharpen as well and in some cases more easily, but they will not hold an edge as long. The flimsy short handled tools should not be used because they make the work of carving more difficult and are more dangerous. This is because a good firm grip can be got on the large tool, holding the handle with the right hand and guiding with the left hand on the blade, making a leverage that prevents slipping and turning (see 'c', plate No. 2). For those who have been using the small tools the larger ones may seem cumbersome at first but the advantages will soon be realized.

A manual training teacher once told his class, of which I was one, that our chisels were not sharp until we could shave with them. At that time I was never able to accomplish such a degree of sharpness, but I have since realized that he was right. I confess I have yet to attempt

shaving my beard with a carving tool. But I do test the sharpness of my tools by shaving the hair off my arm. Professional carvers often let their tools get dull, putting off the inevitable, until they suddenly wake up to the fact that the work has become much too difficult. Better work is done and with more ease when the tools are sharp.

You will need, for sharpening, one of the usual type oil stones about two by six inches in size with one side coarse and one side fine, and one small Hard Arkansas stone. The stone should be covered with a medium weight motor oil before sharpening. If the tool requires much cutting down use the coarse side to start with and finish on the smooth side. A small emery wheel is a very serviceable tool for grinding down tools that have deep nicks or require beveling. In connection with this latter it is well to state that for our purposes the tools work much better with long bevels. Whereas, when carving high relief in hard wood where a mallet is used, the tools will need to be thicker close to the cutting edge to prevent breaking.

When using the oil stone, work over the entire surface as much as possible in order to prevent the stone from wearing down in the center and becoming uneven.

The flat tool is worked over the stone the same on both sides of the tool. With this tool it is best to push it straight backward and forward, being careful to keep the same angle with the stone at all times. When the flat tool is sharpened with a circular motion on the stone the corners are apt to become rounded. The gouges (tools with curved cutting edges) must be sharpened by moving the tool from side to side along the stone and rocking the tool at the same time. In working on the oil stone, both the flat chisel and the gouges should be held at an angle with the stone so that the first grinding shows on the back of the bevel. It is obvious that if you always start sharpening with the tool held at a sharper angle to the stone than the bevel, you will sooner shorten the bevel and have a blunt tool.

By looking at the tool now and then you will be able to observe where the grinding has been done by its brightness. Now gradually work up to the cutting edge. When you have worked up to and slightly over the edge, a slight burr can be felt on the opposite side. Now the Arkansas stone (also with a little oil) should be worked lightly on one side and then on the other a number of times until this burr disappears. Now test the tool for sharpness. If it does not have the edge desired, work it lightly over the oil stone again. The chances are the burr will not develop this time. But not infrequently you may be driven to distraction trying to remove this burr and at the same time have a razor edge. When such an obstinate burr develops, the best thing to do is to gradually work it entirely over the edge with the Arkansas stone and then work up another edge on the oil stone.

The gouges have no bevel at all inside. All the grinding is done on the outside with the exception of that done with the Arkansas stone.



One end or small section of this stone should be ground down to a fine point to enable working the inside of the V tool. You will find the V tool the most difficult of all to sharpen because unless the point is sharp the tool will not cut properly regardless of how sharp the sides are.

You will find it easier to get an edge on your tools after they have been used and sharpened a number of times. For the beginner, tool sharpening will not be easy, but with practise the knack will be acquired (see 'a', plate No. 3).

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The simplest method for holding the frame when carving is to extend one side over the table five or six inches and clamp it to the table with C clamps, using a pad or pieces of cardboard between the clamp and the frame to prevent denting. The table for this reason should have the top frame work set in several inches all around from the edge to allow for using the C clamps. If the table is not perfectly level, or if the frame is a little off true, the frame will not lay perfectly level or flat on the table. In such case if you clamp the frame down tight on both sides it will strain the corners. Consequently you must place a stick or pieces of cardboard under the part that is lifted up from the table and then do the clamping. (see 'b', plate No. 3).

If much carving is done it is well to have a table built higher than the ordinary work table in order that you will not have to lean over to the work.

In planning a design for your frame, first sketch various ideas lightly on the corner or corners. When a suitable one is found it should be carefully drawn out with the pencil, showing all the shadings, highlights, etc., so that a definite idea of the finished carving can be visualized. When this is done, take a piece of tracing paper (any thin white paper will do) cut to the width of the member being carved and place it over the drawing on the moulding. Then trace only the principal lines of the pattern, leaving out all the shadings, etc. Then reverse the paper and trace the lines on the other half of the corner, using a medium soft pencil so that no carbon paper is necessary. (see 'a', plate No. 4).

The tool to start all carvings in low relief is the V tool, which will ordinarily follow closely the traced lines of the pattern. In some cases (in this "lining out") where there is a sharp turn across the grain, one of the curved gouges will work to better advantage, as the soft wood will sometimes tear unless the V tool is very sharp (see 'b', plate No. 4).

After lining out with the V tool the various deep gouges are used to tie up the sharp lines; and after this the shallow gouges and the flat chisel are used to shape off the design. Illustrations will better explain the procedure than words. (see 'a', plate No. 4).

As previously suggested, the frame for the modern painting can well do without a great deal of leaf and scroll corner carvings. If you want a complete discourse on carving you should get a book that deals exclusively with that subject. Practise in this is much the same as in



other things that we do with our hands. Barring personal instruction, a few helpful suggestions coupled with actually cutting into the wood with tools, will teach far quicker than reading volumes on the subject. This is not to minimize the importance or value of the professional's writings on the subject for those who desire to thoroughly study carving. But for the beginner the best thing to do is start cutting into the wood.

Basswood is easier carved than pine, but there are times when it is almost impossible to run a wide gouge along the moulding without splitting out pieces. The grain in such cases is very much like curly maple, although it is not easily distinguished before cutting into it. When you run into this condition the only thing you can do is to cut very carefully, first in one direction and then in the other. Regardless of how careful you are, there will very likely be plenty of patching to do. Where the grain is fairly even the first cut will show which way the grain runs—and naturally you should direct the tool **with** the grain to get smooth cuts. Be on your guard against running **into** the grain, and stop immediately to avoid splitting out large pieces of wood. It is not difficult to patch even large defects in the frame, but this takes time—and the patch is not as strong as the wood. One useful suggestion is this: in cutting diagonally across the grain it is well to stay to the extreme left of the cut if it is a left hand cut, and then come back from the opposite direction to finish the edge you have stayed clean of, thus preventing splintering on one side of the line or gouge (see 'c', plate No. 4). This same idea must also be used at times when you are cutting a line or gouge directly along the length of the moulding, as the peculiar direction of the grain may cause splintering on one side of the cut. Another suggestion is this: when cutting directly across the grain with a shallow gouge it is best to hold the tool at an angle rather than drive the cutting edge directly against the grain, because in this way there is a tendency to slice the wood and it is not so apt to tear (see 'd', plate No. 4). And in cutting directly across the grain with a deep gouge you should rock from side to side or wiggle the tool as it is pushed forward slowly (see 'e', plate No. 4). And one safety measure is this: never have a hand or finger in front of the tool when carving; never hold a frame or block of wood with one hand and carve with the other. If these rules are followed you need never worry about bad cuts. The best way to avoid such mistakes is to get in the habit of always using both hands on the carving tool as this is the easiest and best way to carve for satisfactory results (see 'c', plate No. 2).

As previously suggested, the more elaborate compo ornaments are used almost exclusively for the "antique" effects. Compo designs, if discriminately selected, can also be used for either the whole length of the frame or for corner designs, in solid gilding. So that except for the very simplest kind of designs or simply "tooling", you need have little to worry about in the matter of carving. A little ingenuity in tooling and gouging will also eliminate the necessity of your having a wide variety of mouldings on hand. In accompanying sketches I have suggested the

wide variety of designs that can be worked out with a single moulding (see 'f', plate No. 4). And when thus shaping a moulding by hand into a decidedly different pattern the surfaces will be left uneven and the lines irregular, which in most cases is the effect desired.

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## FINISHING

### Preparation of Base For Gilding and Laying of Metal Leaf

In explaining the process of finishing I will first go entirely through the gilding of a frame in metal leaf, as various of the stages of this type of gilding are applicable to gilding in genuine gold leaf; and since ninety per cent or more of artists frames are metal leaf (imitation gold), it will be more practical to give you that type of gilding in a complete continuity.

The first thing to do is to fill the nail and screw holes and patch any defects or marred spots. For this you need whiting and a rabbit skin glue size—which for convenience I will call the **primer glue size**.

There are three different glue sizes used in this and subsequent stages of gilding. All are simply rabbit skin glue and water in different proportions. For our convenience in detailing the various operations I will designate each of these with a title.

The three glue sizes, their proportions, and uses are as follows:

**Primer Glue Size**, 1 ounce glue—1 pint water. Used for priming coat over raw wood and for making patching putty.

**Composition Glue Size**, 1 ounce glue—1 pint water. (This size will not be strained or set aside as it will all be mixed, as soon as dissolved, with 9 ounces whiting to make the composition).

**Burnish Glue Size**, 1 ounce glue—1½ pint water. Used in mixing with burnish clay to make **Burnish Clay Size** for genuine gold and silver burnish work.

With a hammer break the sheet of rabbit skin glue into small pieces, place in a tin can or preferably in a glass or jar, and cover with the proper amount of water; let stand for several hours or over night, when the glue will have become soft. Then place the can or jar in another container of hot water until the glue is entirely dissolved when stirred up. Strain through a cloth and set away in a cool place and in sealed container to prevent evaporation. The size when cooled will become a stiff gelatin; when again heated for use it will turn to liquid.

Note: Other hide and gelatin glues can be used in possibly about the same proportions as above given. After much experience, however, I have found the rabbit skin glue so far superior in every respect to any others, that it would be foolish not to insist on its use entirely in these processes. Other glues will spoil more quickly, develop cracks in composition, and break and crack on burnish work.

One of the principal advantages in using these formulas (which you may vary in proportions if you care to for experimentation) is that all the guesswork is eliminated and successful work insured with a minimum of effort. For instance, I have at times used the casein glue which I had left over from joining, to mix the patching putty; and frequently,

when the patches became dry, they were either too hard or too soft. At one time in making the patching with the casein glue I made a curious discovery. The glue and whiting upon being mixed together absolutely refused to "stay put". Instead of becoming a stiff putty it became a peculiar mass that acted similarly to quick silver. The manufacturer informed me that the only difference they were able to discover in that whiting and previous shipments was a slightly higher acid content. But the rabbit skin glue, on the other hand, was not affected by this whiting.

Place about a teaspoonful of whiting on a piece of glass six inches or more square, which is used as a palette on which the **primer glue size** and whiting are mixed with a putty knife. The mixing should be done in a warm room to keep the size from cooling and setting too quickly. (Every process connected with the application or use of any of the glue sizes should be in a room at least moderately warm). This should be mixed up thoroughly to a stiff putty. If the mixture is too stiff to work up smoothly add a few drops of size; if too thin, add a little more whiting; and so on until it handles well. If this putty is too soft or pliable it will shrink after it has dried out. It also works better when fairly stiff. A small gouge or flat carving tool, palette knife, or similar tool can be used for the work of patching. It is a good idea to daub the holes or defects with a little water or glue size before filling so that the putty will adhere better. Firmly press the putty into the hole so that it is entirely and solidly filled. Smooth the patch off but let it be a little above the surface in case of shrinking, as it can be sanded down smooth when dry.

If there is quite a lot of patching to do the putty may become stiff before the job is finished; in which case you should add a few drops of warm water and work it out on the glass again.

Small patches in nail holes, etc., will take twenty minutes or so to dry. The heavier patches in screw holes will take from thirty to sixty minutes or more depending on the warmth or dryness of the room, before they can be sanded down. Where there are splits or breaks in the carving or on any sharp edges that are difficult to shape with this putty, plastic wood may be used to better advantage.

When the patches are all dry, sand off with a coarse or medium sandpaper all the rough surfaces, sharp edges and corners, and the patches. This sanding can be done with a rather coarse grade of sandpaper. If the frame is heavily tooled but has no delicately carved designs, a No. 1 sandpaper combined with a little "elbow grease" will quickly wear down the tooled surfaces and sharp edges. On delicately carved corner designs it is best to use a No. 1/2 or finer grade. A good smooth moulding which has not been carved at all will not require any sanding, unless it is simply to "knock off" the corners and sharp edges.

Brush off the frame well; and then, with a bristle brush, give the entire frame a generous coat of hot **primer glue size**. When this is dry, rub the frame down with No. 1/2 or No. 0 steel wool.

Now you are ready for the composition. Prepare the **composition glue size** (as given on page 14: 1 ounce glue—1 pint water) in a one-pound coffee tin or similar receptacle. When the size is ready for use add to it in the same can nine ounces of bolted gilders whiting. Stir up thoroughly for several minutes until well mixed and keep warm in a pan of warm or hot water. It is now ready to apply.

The proportionate amount of water given in this recipe should make about the right brushing consistency where several coats are applied to obtain a good smooth job. The amount of water may be increased or decreased for experimental purposes. For stippled work (which will be discussed later) it is better to decrease the water in order to have a heavier or thicker composition.

Lay the frame on the table and work on one side as usual. Keep the composition warm while using. Apply with a bristle brush one and one-half to two inches in width. This composition sets rather fast so it should be worked as quickly as possible. Be sure the first coat is brushed into all the sharp cuts and gouges. Use a good full brush, work it on vigorously and then smooth it out. If the moulding is very wide and has definite divisions in its contour, one section may be done at a time to advantage. When the frame is entirely covered with the first coat hang it up to dry before applying the second coat. Three coats should be applied in this manner, allowing each coat to dry thoroughly before applying the next. When you are finished with the composition set it away in a cool place for future use.

Three coats will give a fine base on which to sand out a smooth surface. Less can be used if the job is not too particular and none are absolutely necessary, as oil gilding can be done directly over shellaced wood. Genuine gold or silver burnish work should have four or five coats of composition.

When the last coat is dry sand the frame with No. 0 or No. 1/2 sandpaper. With three coats of composition the sanding can be rather vigorous on the broad smooth surfaces without cutting through to the wood. Sharp edges should be sanded very little, and delicate carving is sometimes better smoothed with steel wool. This completes the composition process.

Stippled surfaces are sometimes used to advantage, either over the entire moulding or only on certain sections. The stippling can be done in one coat directly over the sized wood if you use a thicker composition (see inset, top of this page), or it can be applied after one or more smooth coats have been brushed on and allowed to dry. The stippling is a very simple operation: Brush the composition on solid as usual and then go back and forth with a straight up and down daubing motion with the brush until the composition starts to set. If the daubing continues after the composition is getting well set it will make a finer stipple. For heavy or coarse stipple effects it is always best to use a thicker composition. Where a combination stipple and smooth surface is desired, apply the smooth coats first and when dry apply the stipple to the section desired. If the stipple is daubed over a straight edge it may be wiped clean with a wet cloth while it is still wet or sanded off when it has dried. Ordinarily the stippled surface is best left un-sanded.

\* \* \*

After the composition is sanded brush the frame off thoroughly and you are ready to apply shellac. Either white or orange shellac may be

used. There are several qualities of shellac. Never under any circumstances use an **imitation shellac** or a **shellac compound**. Use only shellac guaranteed to be pure. I have more than once gotten a bad grade of shellac even in cans from reputable firms which were labeled "pure shellac"—bad at any rate for our purposes as we require a quick hard drying shellac. These cheaper shellacs often take a day or more before they set absolutely dry and hard, and sometimes have greasy or oily ingredients in them. In good drying weather, the right shellac will be dry enough in two or three hours to allow the work to continue.

The consistency for this purpose should be very thin. Thin with denatured alcohol. Equal parts of shellac and alcohol should make about the right consistency. Apply two coats, allowing the first to set two hours or more before applying the second. The brush should be a camels hair or red sable of good quality, one and one-half or two inches in width. Shellac sets almost as soon as it is brushed on. Consequently it must be worked very rapidly. The brush should be generously filled so that the shellac will run into all the deep cuts and gouges. With long strokes brush quickly over the entire side of the frame, and then a few strokes over to smooth and pick up the shellac where it has run. Be sure to pick up the shellac on the corners so that there is no heavy gummy over-lapping which will take longer to dry. Like the composition, this shellac may also be applied on one segment or section at a time if the moulding is large and has definite divisions. The important thing to begin with is, of course, making sure that the entire surface is covered and that no spots have been missed—otherwise the oil will sink into the composition. After a little practise you will acquire the knack of applying shellac. Important to remember is having the shellac for this purpose **very thin**, as it will flow on much easier and smoother, and two coats will be ample. The brush should be kept exclusively for shellacing. It need not be cleaned out thoroughly after using as the stiffness can be quickly soaked out by placing the brush in a shallow container with enough denatured alcohol to cover the hair. Be careful, however, when laying the brush aside after partially cleaning, not to lay it so that the hair is touching anything, as the hairs will stick and be broken in removing after the brush has dried. The shellac for this purpose should be kept in a separate container from the clean fresh shellac because of the whiting dust it will have picked up. While on the subject of shellac I might mention that it is advisable to keep your shellacs in—or empty them into—glass jars, as they will turn dark in tin cans after exposure.

If the shellac has been thinned enough and applied smoothly it will be dry enough within two or three hours after the second application to be rubbed down with steel wool. (Whenever there is time, however, it is best to let it stand several hours longer or preferably over night before rubbing down and oiling). Use a No. 0 or No. 00 steel wool. This wooling takes off any small asperities and leaves a smooth polished surface for the oiling and gilding. Brush the frame thoroughly when the wooling is finished.

There are other methods or variations that may be used in place of the two coats of shellac over the composition:

1. You may apply one coat of hot **primer glue size** directly over the composition. This will be sufficient to hold the oil ordinarily. When this is dry you may give it a thin coat of shellac for safety if you care to. But for an antique job I would leave the shellac off entirely.

2. You may want a color under the metal leaf with the idea of rubbing through to get an antique effect similar to the genuine gold and silver antique jobs. In this case apply one coat (or more if desired) of **burnish clay size** (a larger glue content in this case will not be detrimental. See page 29). When this is dry apply one coat of shellac or a coat of **primer glue size**.

It will be very instructive and beneficial for the beginner to experiment with these and other variations in different departments of the work.

\* \* \*

Now you are ready for oiling the frame—the important thing in getting a clean bright gild. Have the work table well brushed off before starting. The oil is applied with a stiff bristle brush. There are special brushes made for this purpose but any bristle brush or large size artist brush will do. I have always used about a one and one-half inch width for all size mouldings.

Broadly, there are two types of gilding oil—one slow drying and one fast drying. The slow oils generally are made to dry over night, or within approximately sixteen to twenty-four hours. The fast drying or Japan (being a trade term) oil will dry within approximately one hour, and is rarely used by itself for gilding, but is used mostly as a drier to mix in various proportions with the slow oil to speed up its drying time as desired. In the following instruction I specify a set proportion with its approximate drying time of the two oils which I have used and found to be of consistently high quality. This proportion may vary greatly, depending on the type or particular brand of gilding oil that you use, as the products of different manufacturers will vary greatly. The quality of this gilding oil is a very important factor in the process of oil gilding, and its comparative cost as an item in the production of a frame is extremely small. Consequently, you should use only the very highest quality of gilding oil.

Mix in clean container, two parts slow drying oil with one part Japan oil. Use a small deep lid or any small clean receptacle to measure the proportions fairly accurately. Apply vigorously to one side of the frame at a time. Pick up enough oil in the brush so that you will be sure to fill all of the sharp lines and gouges as well as have the entire surface well covered. Brush over the moulding several times and in various directions. Now take a clean cloth (as free of lint as possible) and **wipe the oil off**. Naturally if **all** the oil is wiped off the leaf will not hold when laid on. Yet on the other hand it must be wiped to the point where there is absolutely **no surplus oil** left on the frame, **except** in the sharp cuts and gouges and the deep concave sections of the moulding. Now the purpose in wiping this oil is to give a bright even gild when the leaf is laid and to assist in a quicker drying or hardening of the finished frame. The reason you do not want to remove the surplus oil from the sharp lines and gouges is because the leaf will break when it is pressed into these parts, and as a consequence the thicker and wetter oil is nec-

essary to hold the skewings or scrap leaf that is rubbed into these places. Furthermore the less bright gilding is not readily apparent in these depressions and ordinarily is entirely covered up with the toning (which is the last operation in the production of the frame). Thus in wiping the oil off do not crumple the rag up in a ball because in this way you will be apt to pull more of the oil out of the depressions. It is better to stretch the rag over two or three fingers so that in wiping across an uneven surface the high parts are cleaned and the low parts hardly touched (see 'g', plate No. 4). Go through this process on one side of the frame at a time. When the last side is finished mark on the back of the frame the time the oiling was finished and hang it up or lay it aside in a place free from dust. The leaf will be ready to apply in one and one-half to two hours—if the work is being done in a room of average warmth and dryness.

The oiling brush can be set in a receptacle of gasoline (better than turpentine for this purpose) with the bristles kept well covered. When the next job of oiling is done brush the gasoline out well until the brush is practically dry before doing the oiling.

This wiping off of the oil reduces the drying time to one-half or less. The same mixture of oils (two slow oil—one Japan oil) when not wiped clean with the cloth will take from three and one-half to four and one-half hours to dry for proper gilding under the same conditions. I would advise you to experiment with both ways of oiling so that you can see the great difference in the finished gilding.

For your experiment—first brush the oil on in the same way. Then remove as much oil as possible from the brush by scraping it back into the oil container. Then with the brush, smooth out and pick up as much of the oil as possible from the frame—but do not wipe with the cloth. Let it dry for the longer period—that is, about four hours. When the leaf has been laid and rubbed down it will not have the same even texture and hard polished appearance as when the oil is wiped, and one leaf may appear much brighter than another laid beside it, thus making the laps or divisions more apparent. The reason for this is that parts of a single leaf are thicker, or one entire leaf may be thicker than the others in the same book of metal leaf (which is not apparent before laying). Thus, over this heavier base of oil the thinner leaf when rubbed will “mat” and the heavier leaf remain brighter. This occurs to some extent even when the oil is wiped, but the difference in the texture or thickness will not be so noticeable.

Then experiment with the wiping off method, but let it stand the same length of time as when it is not wiped (three and one-half to four and one-half hours). You will find that the oil will still hold the leaf fairly well, but the laps will show up and pull away, the breaks or cracks in the leaf will not fill properly, and sharp edges will be too dry to hold the leaf. Also experiment with the wiping method by using a very firm pressure and going over the moulding a number of times until it appears that there is no oil left on the frame—and do the gilding in the usual length of time (one and one-half to two hours). This experiment also will result in the leaf not holding properly, and its principal purpose will be in teaching you just how much wiping can be safely done.

These experiments can be done on small scraps of moulding or on sample corner pieces which you can re-gild at any time for future studio use. These experiments will be of invaluable service to you in acquiring the knack of good gilding.

You need not use exactly the proportions of oil that I give here if you find a longer drying time more convenient. The main thing, however, is to experiment so that you know any given proportion is ready for gilding at a specified length of time. This will eliminate the guesswork. I would not advise using a quicker drying mixture than the one I have given you. On the other hand I do not think that a drying time of more than



six or seven hours is advisable. The oiling and gilding can, with the quicker drying mixture, be done in the same day; the oiled frame will in the shorter period pick up less dust; and the temperature of the room will be more even.

Weather conditions affect this oil, of course. Excessive dampness will prolong the drying; excessive cold will chill the oil and prevent proper drying; excessive heat (as over a register or stove with hot circulating air) will speed up the drying; and so on. Thus for best results it is best to do the oiling and gilding under average conditions.

Never thin these oils with turpentine or any other thinner as their effectiveness will be greatly reduced. After a period of six or eight months they may thicken up some and require more pressure in wiping and take a little longer time for drying. For this reason always keep the containers well corked and sealed. Even though the price is comparatively higher it will probably be more economical to buy this oil in the smaller containers (depending of course on the amount of work you turn out).

Before closing I again want to impress on you the importance of the oiling operation as the key to good gilding. The actual laying of the leaf has very little to do with the quality of the finished gilding. As I have already explained, the best oil gilding will be done with the wiping method. But if you should oil without wiping, be sure that the oil is well dried or set before laying the leaf. To do good work in this way the oil should be dried to the point where, when the finger is pressed against the oil, it will not show any impression at all; and, when the finger is pulled over the oil with a firm pressure it should make a whistling sound.

From the oiling stage on through until the frame is entirely finished you will have to handle the frame more carefully. So, in picking up and moving the frame around, hold the fingers against the rabbet and lift up against the under side of the lip.

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Now comes the actual laying of the leaf. You will find this operation a bit awkward at first, but the knack will be acquired with a little practise. If the leaf breaks a great deal on the first jobs there is no great cause for worry as the breaks can be filled by laying another piece of leaf over the break and carefully pressing and rubbing it down. And, in any case, your first jobs will probably look first-rate to anyone but an experienced gilder.

Metal leaf (imitation gold leaf) is put up in thin tissue paper books—twenty-five sheets to a single book, and twenty books in a pack—generally five and one-half inches square. It is made in three or four different shades, similar to the shades of genuine gold leaf, but not corresponding exactly. Metal leaf, if exposed for a long period, is apt to tarnish; so, it is advisable to keep the books well wrapped and covered in a cardboard box. Aluminum leaf, which is put up in the same way, corresponds to the genuine silver leaf; and it has the advantage of never tarnishing, as will the metal leaf and the genuine silver. Both metal leaf and aluminum leaf are much thicker than the genuine gold and silver, and are therefore much easier handled. Their cost per square inch is about one-fifteenth that of genuine gold leaf.

Cover the table with a clean paper and lay the frame so that it extends an inch or two over the edge of the table. The laying of the leaf should start at one corner (I usually start from the right and work to the left when laying leaf—then rub down the leaf from left to right. This seems to be more convenient for me, though it is a matter of personal



choice) and go entirely around the frame—the leaves being started from the outside bottom edge of the moulding, and with each succeeding leaf over-lapping the previous one about one-fourth inch. The forefinger on each hand should be held on the under side of the book, and the tips of these fingers, with the book folded back over, direct and press the exposed leaf into the concave sections of the moulding. The wide and more shallow concave sections can be laid without breaking the leaf, but the deep gouges and concave sections will be bound to have plenty of breaks. Accompanying sketches illustrate this procedure (see 'a', plate No. 5).

As soon as the leaf has been laid entirely around the frame tamp it down into all the sharp cuts and concave sections with a long bristle brush—preferably one that is not very stiff and about one and one-half inches in width. Be sure that any large breaks or cracks (other than in the depressions) are first covered with a clean piece of leaf and rubbed down. Now take the scrap leaf — or new leaf if necessary — and with the brush rub it into all the low spots and breaks in the leaf, being sure to always rub in the direction **with** the laps (see 'b', plate No. 5).

If no clean brush is available this tamping down and rubbing in of scrap leaf can be done with cotton or sheeps wool which is next used to rub down the leaf. Cotton should be a clean refined grade free from any gritty particles. Sheeps wool simliar to that found on shoe polishing outfits is better than the cotton. It should be cut into about three-inch squares and it should occasionally be combed out to keep it soft and fluffy. I have also found "Kleenex" to be a pretty good substitute when the others were not available.

As soon as you finish rubbing in the scrap leaf with the brush, take the wool and rub the leaf **in the direction of the laps** with a good firm pressure. Go over the leaf several times in this manner and also rub into all the uneven and low spots in order to insure that the leaf is well secured to the oil all over (see 'c', plate No. 5).

While the leaf can be entirely rubbed down and finished immediately, it is better, after the preliminary rubbing, to let it stand over night so that the oil becomes a little harder or dryer. Then this second time you can rub the leaf more vigorously until all the laps are entirely removed. Always be sure that you have rubbed firmly in the direction **with** the laps before you rub back and forth to remove them. At times it is necessary to rub directly across the moulding in order to remove a lap, but always finish up by rubbing lengthwise with the moulding as the leaf will to some extent catch the light according to the way it is rubbed.

Always save the scrap leaf. On narrow mouldings there will be large pieces of waste. Put it away in a can or box for future use. When it has been used over and over a number of times it will have collected dust and grit and will be too finely ground for further use. At times when you have run out of scrap leaf it will be necessary to use new leaf for rubbing into the breaks.

Now brush the frame off well and you are ready to shellac. This can be done immediately if desired. However, the longer the frame stands after the leaf is laid and before the shellac is applied, the better opportunity the oil has for drying underneath. Consequently, whenever

er you have time let the gilded frame stand a day or so longer before applying the finishing coat of shellac.

There may be bad breaks or defects in the gilding that require patching. If so, these should be patched before the shellac is applied. A quicker drying oil may be used if you are in a hurry to finish up—even straight Japan oil. But be sure you know the drying time if you use a quick size, because you may have the patching to do all over again.

Defects may occur for several reasons. First: the shellac may not have covered the frame entirely and as a consequence the oil soaked in those points missed. This is not very apt to occur, however, if two thin coats have been carefully applied. Second: in brushing on the oil, spots may have been skipped. This is more apt to happen because the oil is clear in color and does not change the color of the shellaced composition, so that parts missed are not apparent. But since all the smooth high parts are gone over with the wiping rag it is not likely that this will occur so much on these parts as in the concave curves of the moulding. Third: if the frame has been wiped too clean of oil in places (frequently on sharp edges, or on the corners of the frame that get a double wiping), these parts will dry hard by the time the frame is ready to gild and consequently will not hold the leaf.

Any of these spots must be oiled again—after the frame has been thoroughly rubbed down and brushed. If the defect has been caused by the first reason given (lack of shellac), this part must be given a thin coat of shellac before oiling—but, as previously mentioned, this will seldom be necessary. In oiling for the patches be sure the oil laps well over the break or opening in the leaf. This oiling should be done with a cloth only—holding it drawn tightly over one finger as in the process of wiping the oil. Have the cloth only moist with oil—not sopping wet. The stroke should follow the direction of the sandpaper marks, or generally lengthwise in the direction of the moulding. If the spot is too heavy with oil it will not gild as bright as the rest of the frame. The most difficult parts to patch are the wide flat panels, for these parts always show up any kind of defects more than uneven or carved parts. If the defects are very slight it is best to let them go unpatched. The leaf should be laid as soon or sooner than for the regular gilding in order to insure that the leaf will not rub away from the edges of the oil. In rubbing down the patch, work out from the center to the edges in order to better insure the leaf sticking to the very edge of the oiled spot. However, even though the leaf does not stick to the very edge and leaves a slightly whitish edge around the patch it will be largely eliminated when the protective coat of shellac is applied to the frame.

And last, the more effort you put forth in the oiling and wiping the less patching you will have to do.

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The same instruction previously given for shellacing the composition will apply here on the final protective coat of shellac over the metal leaf. The shellac, however, should not be of the **very thin** consistency—yet it must still be what would ordinarily be called thin shellac. It will undoubtedly have to be thinned somewhat from the consistency as it comes in the manufacturer's can. Three parts shellac with one part denatured alcohol should make about the right consistency for this use. If it is too thick it will gum up more quickly, causing a blotchy covering over the metal leaf; and the over-lapping of the shellac—particularly on the corners—will be more apparent. As usual it must be applied with long quick strokes, and with the brush full enough with shellac so that it will flow on easily without taking too much time. The same brush used for shellacing the composition can be used for this finishing work.

Of all the brushes used in the entire operation of making a frame, this one particularly

should be of a high quality camels hair or red sable. The results will be well worth the extra cost. And more often than not the longer life of a fine brush actually effects a saving.

You can use either the white shellac or the orange shellac, depending on the cast it is desired to give the leaf. These two shellacs can be mixed in varying proportions, to obtain different degrees of color between the strong color of the straight orange shellac and the colorless white shellac. I use the orange shellac over the deep gold shade of metal leaf, and the white shellac over the lighter gold shades of metal leaf. For the aluminum leaf, I use a mixture of about two parts white shellac with one part orange shellac.

A tincture of gamboge (yellow) or red saunders (orange red) or a combination of the two in the proportions desired, can be added to the shellac to give a little more color to the leaf. Ordinarily the only time you will want this color in the shellac is for the aluminum leaf, which needs something to give it a warmer hue. And even in this case the plain orange shellac should give the desired effect. Use this color sparingly until familiar with its effect.

Both of these colors come in dry form. Place about one-half inch in a small jar and then pour over with an inch or two of denatured alcohol and stir up. After this has stood over night the liquid can be poured off into another container and is ready to use in the shellac. It is safest to pour the color off through a fine cloth to insure against the sediment stirring from the bottom and mixing again with the clear color.

Before leaving this operation it should be mentioned that ordinarily only one coat of shellac can be applied successfully over the leaf. If a second coat is applied, the first coat should have stood at least a full day. A second coat is apt to soften and pull up the first coat—making a mess of the whole job. The difference in this and the shellacing of the composition is that in the latter case the first coat is absorbed by the porous composition, whereas the metal leaf is non-absorbent and leaves the film of shellac on the surface. After the shellacing is finished if there are any spots that have been skipped these can of course be touched up by working quickly and without too much shellac in the brush.

While in hot dry weather the frame may be toned two or three hours after the shellac is applied, it is always best to play safe and give the shellac twelve hours or more before toning.

The shellac will kill to some extent the extreme brilliance of the metal leaf. If you care to lessen the brilliance even more, add just a touch of the dry whiting to the shellac and mix it well before applying. Fine burnish powders of about the same color as the metal leaf can also be used in the same way. Either of these should be used sparingly. I would not advise you to use them on an important frame without first experimenting.

If an extremely bright gild is desired you can use a clear filtered shellac. Filter papers can generally be had at any large drug store or drug supply house. Place one of these papers over a jar with a large opening and press the paper down in to make a receptacle to hold the shellac and bend the edges down around the outside and secure with a string or rubber band. Pour in the shellac and let stand until all the liquid has dripped through. There will be a thick gummy residue. It is better and quicker to thin the shellac considerably before filtering. Then when it is all filtered through let the jar stand open to allow for evaporation and thickening of the clear shellac.

Shellac, like certain types of picture varnish, is likely to "bloom" when applied in excessively damp weather. Therefore, during such weather conditions, you should always

try to apply this finishing coat of shellac in a warm dry room. Should blooming occur it can be partially if not wholly eliminated by brushing quickly and lightly over the shellac (after it has stood several hours) with denatured alcohol. This may be done several times, at intervals long enough to allow the shellac to become perfectly dry. This should not be confused with the "natural" bloom that frequently appears immediately after the shellac is applied, but which disappears within a few minutes when the shellac starts to dry.

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## TONING

Of all the different processes that go into the production of a frame, the last one, toning, is the simplest and yet perhaps the most interesting because of the wide range of effects to be had by the application of various colors over the different shades of metal.

The usual kind of toning is done by painting the color solidly over one side of the frame at a time and then removing the amount desired with a cloth. When all sides are completed you can go back over, polishing off or removing more of the color as desired, with either a dry cloth or one dampened with turpentine or gasoline. **Colors ground in Japan** should be used for this work as they dry flat and quickly. They should be thinned with turpentine to an easy working consistency (very thin for this use) and applied freely with any convenient brush. A bristle brush will work better over uneven or highly ornamented frames.

A good method of toning for very heavy or strong color effects is to paint the Japan color over the entire frame and let it stand for an hour or more until it is dry or nearly so. Then rub it off as much as desired with a No. 0 or No. 00 steel wool.

When you want to paint in a definite panel or section of the moulding in a solid color this same Japan color should be used. In this case it should be thinned only enough to work easily with a soft hair brush, and should have added to it a few drops of **quick drying rubbing varnish** or any quick drying varnish for a binder. These solid panels can be painted in after the usual over all toning has been done or before. If painted in before, they should be allowed to stand several hours until the paint is perfectly dry; then apply a very thin protective coat of shellac over the painted section. Then, when this shellac is dry, the usual toning can be done over the entire frame.

If you want a soft stippled tone effect over all or part of the frame it is best to use the regular artists colors (or any oil colors) which are slower drying. Thin with turpentine so that the color flows on easily. After it has been applied solidly to the frame, take a cloth folded up into a small smooth pad and stipple out until the amount removed or the texture is as desired. Then wipe clean the other parts of the moulding. This stippled tone effect is used to best advantage on only certain panels

or sections of the moulding so as to have the contrast of the bright and dull metal.

As most artists usually have a wide assortment of brilliant colors which can be used where very unusual or colorful toning effects are desired, I suggest that you have only the most essential Japan colors for general toning. These should be: black, white, burnt umber, raw umber, medium green, medium red, ultramarine blue (or one similar) and medium chrome yellow. These will, when mixed in different combinations, produce innumerable shades, and should be sufficient for practically every ordinary toning requirement.

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## "SHORT-CUTS" AND RE-GILDING OLD FRAMES

I have up to this point covered every important detail in the making of a fine metal leaf frame. If my instructions are followed carefully, a little practise will make every operation a simple and interesting process, and you should with diligent application to the work be able to produce as fine a metal leaf frame as you can ever want—and at the same time enjoy the work as a relief from your painting.

Now if you want to "knock out" a job in a hurry you can entirely eliminate the composition. Give the frame when patched the coat of hot **primer glue size**. Then, if you desire a color underneath the metal, give it a coat of **burnish clay size** (see inset 2, page 18). When this is dry rub down with steel wool and apply the usual two coats of shellac.

Neither the glue size nor the burnish clay size is necessary. Two coats of shellac directly over the wood is sufficient. The shellac should be a little thicker when used in this way. The first coat when dry should be rubbed down with steel wool before applying the second coat.

Then steel wool the frame and it is ready to oil and gild in the usual way. Of course the grain of the wood will show through the leaf and the necessity of wiping in order to get a fine smooth gild will be eliminated. If the oil is wiped it should be in a less degree than where you have a smooth composition base because the rougher surface of the plain shellaced wood will not hold the leaf so well. The shellac and toning are applied in the usual way. Occasionally I think this type of gilding which shows the grain of the wood is more effective on certain pictures than the finer surfaced frames.

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Most artists have lots of old frames on hand that are either badly marred up or are gilded in a color of metal that no longer suits the artist's work, and consequently are no longer useful. These can be put into first-class condition with very little work. If the surface of the frame is

in rather good condition all it will require is a little rubbing down with steel wool and one or two thin coats of shellac. If there is much toning on the old frame it is advisable to first wipe off as much as possible with gasoline before applying the shellac. The oiling and gilding is done in the usual way.

If there are any bad nicks in the frame first fill these with the patching putty (see page 15) or with plastic wood. Oftentimes the side edges of the frames are badly marred from standing around the studio. In such cases it is much easier and quicker to either plane these edges smooth or rub them down smooth with a coarse sandpaper than to try to patch countless small nicks. It is better to do this also on sections of reeding or any sharp edges that have numerous nicks. It is much quicker and the finished job looks much better than where numerous patches have been made.

If the corners are very loose they should be tightened before the refinishing is done. If you do not have a joiner to facilitate in taking the frame entirely apart and re-joining, it is advisable to take it to a furniture repair shop and have it pulled apart and the corners re-glued and screwed. On the other hand you can get a fairly solid corner by simply putting a screw in the weak corner (see page 8). In doing this scrape or sand off around the outside of the corner to locate where the original nails or screws are, so that you can avoid hitting them with the new screw. The only tools you will need will be a screw driver and any small drill, auger, or gimlet to drill the hole for the screw.

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## GENUINE GOLD LEAF GILDING

Gold leaf comes in book form the same as metal leaf, though in size only three and one-half inches square. Silver leaf is generally four inches square. Both are much thinner and lighter in weight than the metal leaf, and the gold is still much lighter and thinner than the silver. Gold leaf is in three shades: XX (natural gold color), Lemon, and Pale.

Genuine gold leaf and silver leaf gilding can be done in two distinct methods—oil gilding, as already explained for metal leaf; and water size burnish gilding. However, I will first mention a few variations in the oil gilding method.

Because the genuine gold and silver leaf is more delicate than metal leaf it is best when applying it to the oiled frame to use a gilding tip rather than lay it directly from the book as with metal leaf, because it is more apt to rub through on sharp edges and break more easily; also there is a fine powder on the paper leaves of the book to prevent the gold from sticking to the paper, and if the book is laid directly against the oiled frame some of this powder is apt to stick to the oil and cause

marks under the leaf. But up to this point the preparation, oiling, etc., is exactly the same as gilding in metal leaf—and if you are not looking for a perfect job, the leaf may even be laid directly from the book as with metal leaf.

The gilding tip is a very fine and thin camels hair brush, generally about three inches in width and the hair about two inches in length. As it is difficult to pick up more than one-half leaf of gold it must be cut as it is used.

First lay the book of gold on a stiff card of the same size or slightly larger than the book and hold it in the left hand. Fold back the first sheet of paper and hold it down with the thumb, thus exposing one half (or whatever size piece is desired) of a leaf of gold—then crease the paper so that it makes a straight edge across the gold. The cut is made with either the corner of a sharp blade or with the finger nail, using the right hand to make the cut while holding the book in the left hand. Whether the finger nail or a blade is used they must be sharp and absolutely smooth to prevent pulling or tearing the leaf while making the cut; also they must be absolutely free of any grease or moisture for the same reason.

I have found that gold leaf cuts cleaner with the finger nail and that silver leaf, being heavier, cuts best with a blade—and that both generally require a little sharpening or polishing to work smoothly.

Now to pick up the piece of gold the tip must be first brushed lightly through the hair on the head in order to collect just the slightest semblance of oil—as it is this oil that causes the gold to adhere lightly to the tip. Oftentimes the hair is too dry, or creates an electricity which causes the gold to “jump” to the tip. For this reason it is sometimes best to apply a speck of vaseline to the left arm (a convenient place; or to a soft clothes brush or to some similar object which may be conveniently laid on the table) and rub it out well so that in brushing the tip over the arm it will not pick up any excessive oil—for if too much oil gets on the tip the gold will adhere tightly and will be difficult to transfer to the frame.

Hold the tip between the thumb and forefingers. Place it lightly but firmly on the piece of gold.

I always place the tip so that the gold extends slightly beyond the end of the hairs, rather than allow the hairs to extend clear over the piece of gold. This habit is developed principally from water size gilding in order to keep the hairs from touching the water; but in either water size or oil gilding it has the advantage of allowing you to see the edge of the gold and thus more easily place it on the proper spot on the frame.

Lift it up and place it where desired on the oiled frame. Accompanying illustrations describe various procedures in the handling of the gold (see ‘a’, plate No. 6).

From here on the same instructions as used in metal leaf will apply except for a few minor details: The tamping down and rubbing in of scrap leaf must be done with a soft hair brush—sable or camel hair. A bristle brush will scratch through the gold or silver. The rubbing

down must be firm but more care must be exercised, and especially be careful that the cotton or wool is absolutely clean and free from grit. And always try and allow twenty-four hours or more before the final rubbing off of laps. All of these precautions are used because of the delicacy of gold and silver as compared to metal leaf.

Occasionally it is a good idea to clean the tip in order to remove the grease and the powder. Lay the tip flat on a clean piece of paper. Moisten a cloth with alcohol and rub in direction of hairs.

\* \* \*

Burnish gilding requires more preparation, more care, and more skill than oil gilding. However, the extra labor is justified in the rich and subtle effects that can be obtained whether in solid mat and burnish or in rubbed and antique effects.

Prepare the frame with the glue size and composition in the same manner as already explained in the metal leaf process except give at least two more coats of composition—or at least five coats altogether. Sand off in the same way, using a finer grade of sandpaper if you want a smoother surface. But at this point, when you have finished sanding the composition, the method changes completely. You are now ready to apply four coats of burnish clay (red, yellow, or blue-grey as desired—or mixtures thereof) mixed with shellac in the following proportions:

All measurements by bulk—not weight. Shellac to be in original consistency as it comes in the manufacturer's can, and clay in original thick paste form.

First coat	— 2 parts shellac	— 1 part clay
Second coat	— 1 part shellac	— 1 part clay
Third coat	— 1 part shellac	— 2 parts clay
Fourth coat	— 1 part shellac	— 3 parts clay

The clay and shellac must be thoroughly mixed so that there is no lumpiness left in it. After the clay is well mixed with a stick finish with a stiff brush. The mixing is best done in an open bowl or deep dish. It will be found easier to mix a fairly good amount of each of the different four coats and set away in tightly sealed and marked glass jars for future use.

Now apply this clay over the entire frame, working on one side at a time, as usual, with a soft camels hair or red sable brush from one to two inches in width. Each of the different mixtures should be thinned as needed with denatured alcohol to flow on easily and smoothly. It should be applied as quickly as possible as it sets quickly. It is advisable to allow at least an hour or more between coats—in hot dry weather this time may be slightly reduced. As each coat becomes perfectly dry the broad smooth surfaces may be lightly sanded with a very fine sandpaper if desired. The last coat should stand at least three hours before the work continues—and preferably over night.

Sharp angular edges may be sanded through to the composition to advantage if you intend to burnish those parts, as they are less apt to crumble or flake off under the pressure of the burnishing agate if the **burnish clay size**—which comes next—is directly against the composition. This, however, is intended only for extremely delicate or sharp edges, and is not necessarily required. This is one of the finer points that you may experiment with at leisure.



Then apply one coat of **burnish glue size** (see page 14) over the entire frame. Apply quite warm, with a soft hair brush. When this has become perfectly dry you can apply the **burnish clay size**—which you are now ready to mix.

The **burnish clay size** is a mixture of burnish clay and **burnish glue size**. This also should be mixed in a bowl or tea cup, as the shape is more convenient for mixing. The room should be warm and the mixing cup warm to prevent the glue from cooling and jelling. In order to keep it warm, the cup may now and then be set in the pan of hot water in which you have heated the glue size. Now place in the cup a small amount of the clay in its usual thick paste form. Then pour in and mix with a stick a little of the warm **burnish glue size**.

In connection with this, as well as the shellac and clay mixture: It is advisable to keep your burnish clay in a tightly sealed jar to retain the original moisture content as it comes from the manufacturer. If after a time it seems to have stiffened up or dried out some you can add a little distilled water until it seems to be of about the original consistency.

This also applies to your **burnish glue size**. It is better to keep it in a narrow necked bottle which can be corked and which when being heated and used will be less apt to lose moisture by steaming. But you will not be able to add any water to this, however, as it would be impossible to determine the amount. But in either case there will be little occasion to add water if you keep them tightly sealed.

When the clay is well broken up and mixed to a thin paste form the brush can be better used to finish the mixing. Now gradually add a very little at a time of the burnish glue size—mixing well all the time—until the viscosity of the glue brings the mixture to the “flowing” point. When this point is reached the **burnish clay size** is ready to apply.

After a trial or two the explanation of this procedure will be better understood. As this mixing proceeds it may be tested by scraping the brush across the edge of the cup to see how the clay runs back into the cup. At first it will hang in a sort of mass, but gradually as the burnish glue size is added the mixture will develop a definite flowing quality that might be compared to a heavy ready mixed paint. You can demonstrate this by mixing some clay with plain water. You will find that it requires much more water to thin the clay than is required when mixing with the glue size—and it will never develop the creamy or paint consistency.

This process is very important, because if too little glue size is mixed in the clay it will not flow on easily and will not hold the leaf properly; if too much glue size is added after the flowing point is reached the burnishing will not be so bright and the leaf will be more apt to flake off when being burnished. However, the real worrisome part of gold burnish gilding is eliminated in the formula I have already given you in the shellac and clay mixture. I imagine there are many skilled craftsmen whose labor will be greatly lessened with that knowledge.

Apply three or four coats of this **burnish clay size**—kept warm while using. You can rinse out in warm water and use the same brush that you used in applying the one coat of **burnish glue size**. Allow each coat to dry thoroughly before applying the next coat. The broad smooth surfaces may be sanded very lightly with a very fine sandpaper between coats—but I do not advise sanding the last coat. (And do not sand at all the delicate edges that I suggested you could sand clear through on the shellac and clay coats). When the last coat is dry, go over the

frame—especially the parts to be burnished—with a slightly damp cloth and develop a high polish. Be sure this cloth is clean and free from grease; and not too wet, as it will remove too much of the burnish clay size.

Now you are ready to lay the leaf, and it is best to do this as soon as the frame is ready, though it will not hurt to wait a few days if it is not convenient to start immediately.

A long wait between finishing the clay and laying the leaf may cause a slight weakening or lessening in the effectiveness of the clay in holding the leaf. In such a case you may apply a very thin coat of warm burnish glue size reduced in strength—about two parts of size and one part of water. Allow this to dry thoroughly before laying the leaf. Do not do this unless you are sure it is necessary. It is always a good idea to test the clay by laying a small section of leaf on the side of the frame before laying the entire frame with leaf.

Prop the frame up on the left side an inch or so and work from left to right (this is a reversal of the order I suggested in metal oil gilding. Either is a matter of personal choice) in order that the water will flow away from the leaf as it is laid . . . Mix in a clean cup **two parts water and one part pure grain alcohol** (if pure grain alcohol is not available denatured alcohol will do). Apply this water size to the frame with a clean camels hair brush about one inch wide **kept especially for this purpose**. Apply it entirely over the moulding in six to twelve inch lengths at a time. Before laying the leaf be sure there is a solid sheen of water over the place where the leaf is to be laid. This sheen of water will usually “stay put” until one three-and-one-half-inch section of leaf is laid entirely across from the outside to the inside edge of the moulding. If the moulding is very narrow and simple in design two or three sections may be laid on before the water size need be applied again.

The cutting and handling of the leaf is the same as already described in laying the genuine gold and silver on oil size. The only difference will come in the actual application to the frame. While the leaf in oil gilding will stick as soon as it touches the oil size it will not pull away from the tip. But in burnish gilding, the moment the leaf touches the water size it is pulled away from the tip and sometimes it will actually jump from the tip to the water. Consequently it requires a quicker and more delicate touch at this point. The over-lap should be about the same as in oil gilding. Breaks are bound to occur even on smooth flat surfaces and more so where the moulding is uneven. Consequently the leaf should be cut in various sizes and widths best suited to fit small sections of the moulding. The accompanying illustration will explain this point (see ‘b’, plate No. 6). As the leaf is laid there will be many depressions and concave parts of the moulding over which the leaf will be stretched out. Lightly touch the leaf with the gilding tip at these points in order that it will break and settle into the depression.

When the frame is entirely laid with the leaf it must stand until perfectly dry before rubbing down. If it is rubbed while there are still

wet or damp spots it will be smeared. If the frame is a large one the first side will sometimes be dry by the time you have finished the last side. If the atmosphere is damp and cold it may be several hours before the work can continue. It will be best to use fresh clean cotton in rubbing down, in order that no grease or oil gets on the leaf. The leaf should be entirely rubbed down and brushed off at this point.

Now you can lay another complete coating of leaf in the same manner (which is not imperative or advisable unless the first coat has so many breaks that it would be easier than covering the breaks individually) or simply apply the size over spots or breaks in the leaf and cut a piece of gold large enough to cover the break. Go over the entire frame until all the breaks are covered that can possibly be covered with the water size method of laying. Rub down and brush when thoroughly dry.

If the moulding has sharp lines and gouges it will be impossible to fill some of these with the leaf in using the water size. After the burnishing is done these will be filled with oil gilding.

I might mention here, that on broad smooth surfaces it is not advisable to oil gild the patches (even though it may not be the intention to burnish that particular section) because oil gilding gives a different texture or appearance to the leaf than water gilding, and would thus show as spots over the water gilded leaf. So wherever it is possible the patches should be first done with the water size.

You are now ready to burnish. For this you will use a burnishing agate, which is shaped to fit various contours of a moulding and is a hard and highly polished stone fitted on a handle. The method of gilding you have just used allows for any part of the frame to be burnished. Too much pressure on delicate edges may cause crumbling or flaking.

After the burnishing is finished you are ready to oil the depressions where the leaf has not held.

No shellacing is necessary. The burnish clay size is sufficient to prevent the oil from soaking in, especially as the oil will remain heavy in the depressions.

Use a very small or fine pointed (depending on the delicacy of the job) camels hair or red sable brush and cover or fill each break in the leaf that requires patching. Should any oil get on burnished parts or any place it is not intended, it should be wiped off with a dry soft cloth first and then with a cloth moistened with lacquer thinner or gasoline. If when the leaf is laid, some of it sticks to these parts that were cleaned off they can still be wiped off again with the cloth moistened with lacquer thinner or gasoline. If you have a moulding with one or more sections of it in fine reeding or "stair steps" these entire sections can be oiled (after the burnishing, of course) and the high or burnished parts wiped clean of the oil in the same manner. This will be found much easier than trying to fill each line with oil by using a fine pointed brush (see 'c', plate No. 6).

When the oil gilding is finished you are ready for the final protective coat of shellac. In order to retain the full brilliance of the burnished parts it is best to use a clear filtered shellac (see inset, page 23) rather than the straight shellac.

Clear lacquer can also be used over water gilded jobs. But lacquer is something like a paint remover and will "cut" any kind of oil paint. In the method just described, however, all of the oil gilding is in the depressions of the frame and even though the lacquer cuts through to a certain extent there will be no great harm done. But I would advise you to not use the lacquer except in case of an emergency where you have lacquer on hand but do not have shellac.

When the protective coat of shellac has dried long enough (preferably over night as in metal oil gilding) the toning can be done in the usual way.

The process of "solid" mat and burnish gilding that I have just explained can be altered so that only the particular parts that you desire to burnish are laid with the water size. You may find it easier to handle all the rest of the frame in straight oil gilding. If you are burnishing only one clearly defined or isolated section or segment that can easily be worked on to the exclusion of the rest of the moulding, then you can apply the clay coats to that particular part only. But if you intend to do burnishing on numerous and various parts of the moulding (with, however, the greater part of the surface even in this case being left unburnished or "mat"—in this case oil gilding) I believe you will find it easier to coat the entire frame with the clay coats just as I have instructed—then lay the leaf with water size only on the parts to be burnished. When these parts are burnished give the balance of the frame a coat of shellac—preferably clear filtered shellac in case you should get some of it on the burnished parts. This shellac need not fill all of the sharp lines and gouges if the design of the moulding and the parts you have burnished make it difficult to work in these delicate places as the oil will not soak in anyway (see page 31). Then do the oiling as previously instructed—except that in this case I believe you will find it easier or better to use a smaller soft brush and take more time at the oiling, in order to get as little oil as possible on the burnished parts, and thus prevent as much as possible the necessity of wiping off the burnished parts with cloth moistened in gasoline (this, however, does not apply to or change what has already been said on page 31 regarding entire sections of fine reeding or "stair steps"). When the gilding is finished apply the protective coat of clear filtered shellac. Tone the frame in the usual manner, as already explained.

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All of the foregoing has had to do with what might be termed "solid" gilding. The beautiful rubbed or antique effects that are so well adapted to genuine gold and silver burnish gilding will not call for so much of the meticulous work required on a solid mat and burnish job. Simply apply one layer of leaf and let all but the very large breaks go un-patched, and also eliminate entirely the oil gilding. Then rub the leaf down with a fine grade of steel wool to allow the color of the clay to show through in whatever degree desired. Then brush the frame off well and burnish all or part of the surface as you desire. Genuine gold thus laid is oftentimes left without any protective coat of shellac in order

that the pure quality of the gold will not be affected in any way. Handling will leave imprints more easily on this un-protected leaf but ordinarily the effect will be beneficial rather than detrimental. Toning may be done in the same manner as already described though the paint will be more apt to stain the leaf itself when left unprotected. Genuine silver leaf will tarnish unless protected, and eventually will tarnish to some extent even under a protective coat of shellac. It is sometimes used intentionally for this tarnished effect.

These rubbed and all-over burnished effects are well adapted to rather plain mouldings of very simple contour, that have very little if any carving, reeding, etc. Thus with less care needed in the laying of the leaf and with the more simple mouldings to work on, it is possible to do this type of work without a great deal of experience or skilled craftsmanship.

The very extreme white (mostly white) and gold antique effects done over the elaborate compo (actually "composition", but termed "compo" to distinguish from our composition of whiting and glue) designs of old French or Italian periods require the least effort in skilled craftsmanship--especially in the laying of the leaf. On this type of water gilding the clay can be entirely dispensed with if you want only the white under the leaf. When the composition is all finished (over the compo ornamentation as well as over the wood) apply one or two coats of the warm **burnish glue size**. When this is dry lay the leaf with the water and alcohol size as previously explained, and then rub (a damp cloth produces a softer effect than sandpaper or steel wool in this case) and burnish as desired. The flaking or chipping off effect can be gotten by applying a coat of shellac to the frame before the composition is applied. Then increase the amount of glue to about double as used in the regular composition formula. Then apply the size as explained above. When the leaf has been laid and the burnishing is done the composition will crack and break off in places.

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## BRONZE POWDER GILDING

Bronze powders are made in varying degrees of fineness and in various shades corresponding to the metal leaf and genuine gold and silver leaf. The very fine powders are used for burnish and mat effects principally. The coarser grades are intended for application with a bronzing liquid. This latter method is familiar to most any household. It is simply a matter of mixing a prepared liquid or medium with the bronze powder to the desired consistency and applying with a soft brush.

Another method is to prepare the frame the same as for an oil gild job in metal leaf. When the frame is oiled and ready to gild, dust

on the bronze powder with a soft cloth. When the surface of the frame is well covered rub down with the same cloth. This should have a very thin protective coat of shellac; otherwise the bronze will tarnish easily (aluminum will not tarnish). The protective coat of shellac will also kill the lustre a great deal. In this type of bronzing it is best not to wipe the oil. I believe you will find this type of gilding is not satisfactory for general use and that the results are not worth the effort required.

\* \* \*

The burnish type of bronze gilding is in many respects similar in method and effect to genuine gold and silver burnish. Of course there is no comparison in the quality of the finished product. This type of bronze gilding requires as much if not more effort and skill than for a metal leaf oil gild and I do not think the results are nearly as satisfactory. Bronze powder in any form simply does not have the "life" or the quality of either metal leaf or genuine gold.

You may prepare the surface in exactly the same way as for genuine gold burnish. The four coats of shellac and clay mixture can be entirely dispensed with, however, with no loss in the quality of the finished product. Simply apply the **burnish clay size** (see page 29) directly over the composition.

In the process of genuine gold burnish work you have noted where I suggested that you could apply the clay to only those parts that were intended for burnishing. In this case, however, the clay must always cover the entire frame.

Three coats will be ample. Now melt up a small amount of the **burnish glue size** and reduce its strength in the following proportion: Two parts burnish glue size with one part water. Then mix the burnish powder with this warm glue size in a cup or glass with a camels hair or red sable brush. This should be mixed thoroughly and for several minutes. (It will not mix perfectly as will, for instance, a bronzing liquid and bronze powder.) Add just enough bronze until it covers easily when tested on the side of the frame. Apply only one coat—as rapidly as possible. When thoroughly dry, burnish with the agate burnisher the same as when burnishing genuine gold leaf. The best protective coat for this is a **very thin clear lacquer**. When the lacquer is thoroughly dry you can tone in the same way as on a metal leaf job.

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## COMPO ORNAMENTATION

I have already made several remarks about compo ornaments. As previously mentioned the compo is largely used for reproductions of antique frames. On page 33 I have told how to make the extreme white and gold antique effects in genuine gold leaf over these compo designs. A very similar effect can be gotten in the regular metal leaf oil gilding

with much less work. When the compo-ornamented frame has had the usual coats of composition I suggest that you use the **primer glue size** instead of the shellac as a base for the oiling (see inset 1, page 18) as it will give the composition less of a polished appearance when the leaf is rubbed off of the high parts of the ornamentation. Or you may want to apply some **burnish clay size** in order to have a color to show through the leaf when it is rubbed. In any case for these rubbed off antique effects in metal leaf I suggest when wiping the oil that you practically clean it entirely off the high parts of the compo so that the metal will hardly stick on except in the low places. In this way when the leaf is rubbed with the steel wool it will come off cleaner, having practically no oil underneath to gum up and make a messy looking job. The actual laying of the leaf can of course be a very slipshod job. If you give it a protective coat of shellac it should be of a very watery consistency. Ordinarily I think it is better not to give this type of frame a protective coat even though the metal will be more apt to tarnish. When you are all through with the leaf, toning, etc., you may want to use sandpaper to cut entirely through to the greyish colored compo in places. But you can work out all of the finishing details of this type of frame to suit your own taste.

Compo is also used a great deal for "solid" metal leaf gilding—both for all-around antique period designs as well as the more modern simplified corner patterns. The main thing is to use good judgment in the selection of patterns.

Compo ornaments are very easily applied to the raw wood frame. If the compo is applied on a flat surface it can be quite thick and heavy in design. If it must fit the contour of a curved or un-even surface it should be quite thin in order to bend easily into place. Compo designs that carry a closely repeated pattern all around the frame usually come in short sections which are applied one at a time. If you do not have a saw to miter the corners before the piece is applied to the frame the mitering can be done after the straight piece has been applied and allowed to set till hard. This can be done by softening the corner with a hot steaming cloth and while the compo is still soft cut the miter with a knife or chisel. The design will seldom match perfectly in the corners but this is usually covered with another piece designed especially to fit around the corner and lay on top of the other compo. The actual handling and application of compo is quite easy: simply wet a towel or a heavy cloth in very hot or boiling water and spread it out on the table. Lay the piece of compo face up on the cloth for a moment until it has become limber. Then lay it in place on the frame and press it down well. When it dries it is there to stay.

The compo pieces are made in perfect reproductions of very exact carvings. If you desire to get an old worn appearance, mount all the compo first and then rub it down as much as desired with a coarse sandpaper. Then rub it down with steaming hot cloths. You will find this a very interesting material to work with.

# SUGGESTIONS

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Don't rush your work. Give everything that needs it plenty of time to dry.

\* \* \*

Don't try any genuine gold and silver burnish work until you have become perfectly familiar with metal leaf oil gilding.

\* \* \*

Wash out and save all the empty tin cans, glass jars, etc., that collect around the house. They will come in handy in your frame work.

\* \* \*

You should have a stiff dusting brush (or any ordinary bristle paint brush) to brush off your frame after sanding the raw wood; after sanding the composition; and after steel wooling the shellac; also to brush the rabbet and the back of the frame before applying the gilding oil. A table brush is also a very serviceable article to quickly clean off your work table after sanding frames, etc.

\* \* \*

I have already mentioned the value of experimenting with the various processes in learning the work. If you will do this experimenting on pieces of moulding ten or twelve inches or more in length or on individually joined corner pieces, your work will have accomplished a double purpose as you will thus have a variety of samples for use in your own studio. These samples will be of the greatest assistance to you in selecting the right frame for each picture. In your leisure time work out new metal and tone combinations, antique effects, etc., until you have a wide variety to choose from when planning a frame for a picture.

\* \* \*

If you are a beginner, I especially recommend, for gilding your first frames, that you follow my suggestions under the heading of "SHORT-CUTS"—that is, patch and sand the frame, and apply the two coats of shellac; leaving off the composition entirely. Then oil, gild, etc. I make this recommendation for the reason that it will eliminate the details of mixing and applying the composition; eliminate the necessity of wiping off the gilding oil; all of which might appear confusing to the beginner. After you have made a few frames in this way, you should, of course, use the more complete method for finest results.

\* \* \*

Whenever possible start several frames at the same time and work them through each stage together. When you have prepared and heated your composition it will be very little more work to apply it to three frames instead of one. When you have cleaned out your oiling brush, proportioned your oil, etc., this preliminary work may as well take care of three or four frames as one. And so on in each operation. Perhaps until you have made three or four frames it will be wiser to work on only one at a time. But as soon as you get the "hang" of the work it will mean a great saving in time and materials to carry through several frames at a time.

\* \* \*

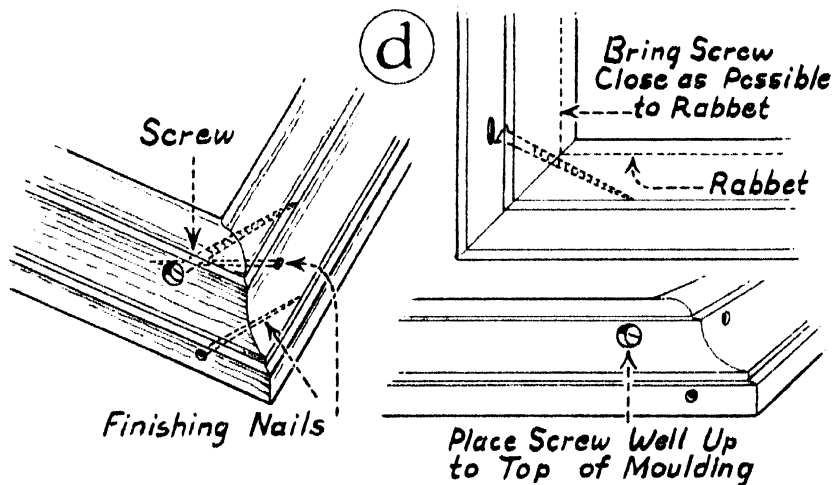
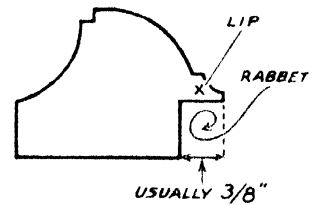
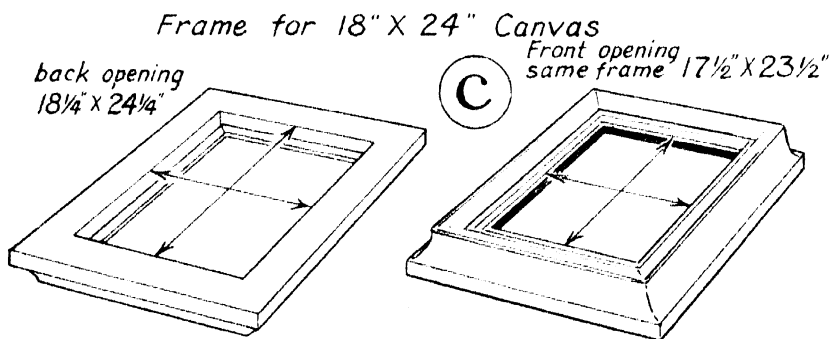
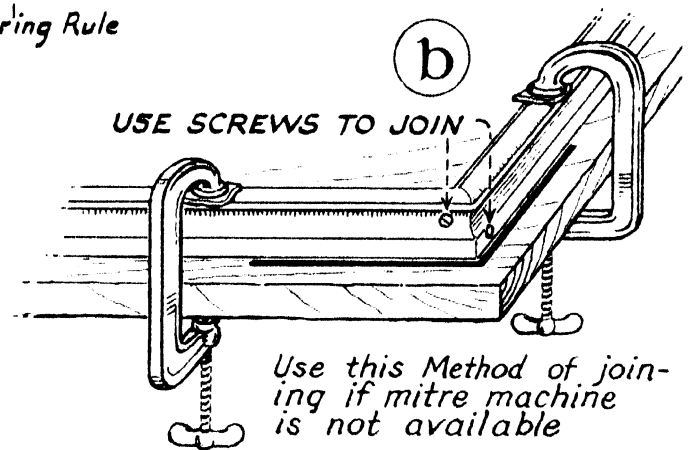
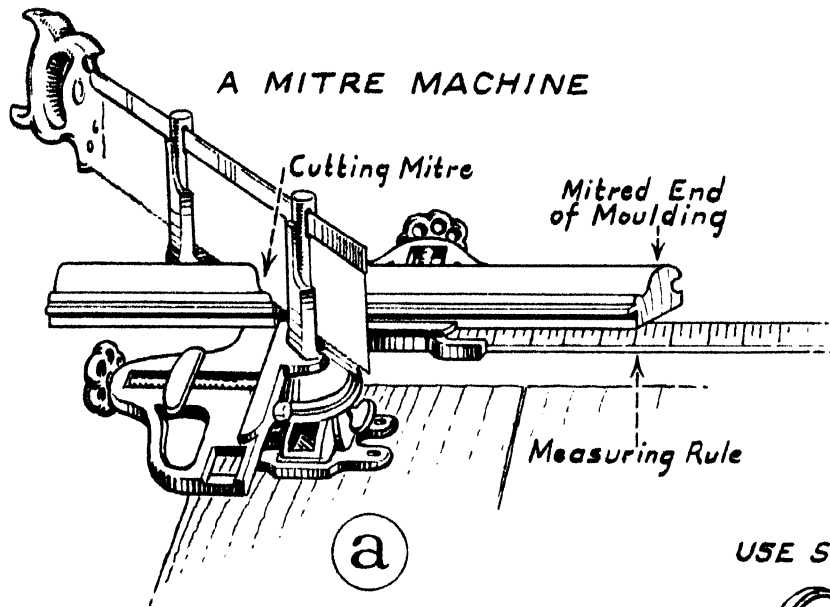


I have yet to find any kind of paint shop or studio that always has a clean paint pot on hand when it is needed. In this gilding work you will be wanting clean small receptacles quite regularly when using shellac, gilding oil, toning colors, etc. The drawing (see 'd' plate No. 6) will show you how you can make these receptacles out of heavy paper or very thin tough cardboard. The best type of paper is that used in the plain regulation postal cards. It is stiff enough and does not break when creased. These receptacles cannot be used for any material that has any water content whatsoever as the water will soak into the paper and melt it. They can be used only for shellac, paint, oils, etc. You may have been taught how to make these little boxes in kindergarten, but if so you have likely forgotten it by now.

\* \* \*

I would like to impress you with the idea that elaborate or special design carving is unnecessary in the production of a good, professional-made frame. As I have said under the heading of carving, the plain moulding, gilded, is at times preferable for some pictures. What is known by frame craftsmen as "tooling" makes a broken up surface which softens the gild, takes the toning effectively, and is appropriate for most any painting, while a carved corner—unless carefully planned and selected—might be detrimental. "Tooling" is merely the use of the flat chisel or the shallow gouge tools in cutting off some of the sharp edges and smooth surfaces so that the mill-run moulding takes on a more uneven or less rigid appearance—the flat chisel being used principally on the convex parts and sharp edges, and the gouge tools being used in the concave parts. Tooling in this manner is very easy and is excellent practise for the beginner in carving. And since it effects a more appropriate frame in the majority of cases, I suggest that you stay entirely away from any carved designs on your first frames, for the art of fine carving is by no means absolutely necessary to the making of a high-class frame.

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AFTER 2<sup>ND</sup> JOINT IS MADE SIGHT OPPOSITE SIDES



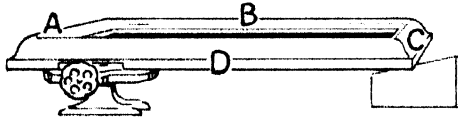
Showing  
A & C  
Parallel

(a)

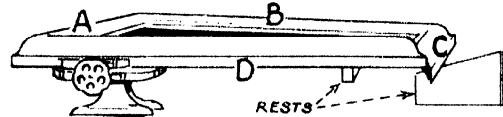


Showing Loose End  
of A Higher than  
Loose End of C

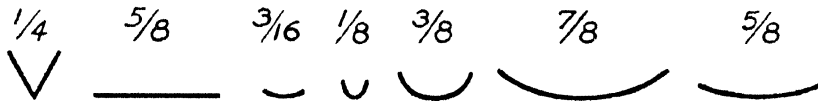
In Making 3<sup>rd</sup> Joint, Rest ABC  
So that B & D are Parallel



In this Case  
When Making 3<sup>rd</sup> Joint, Rest ABC  
So that D is Higher on Loose End than B



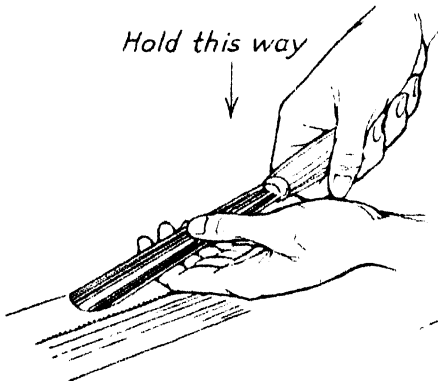
(b) Cutting edges of a well-balanced set of carving tools



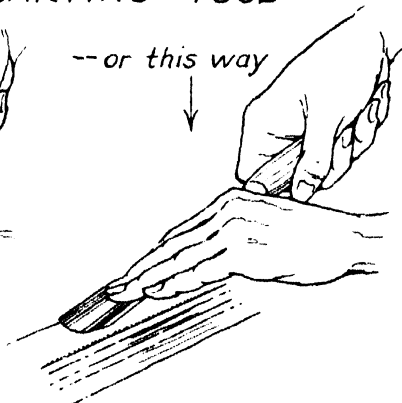
(c)

USING CARVING TOOL

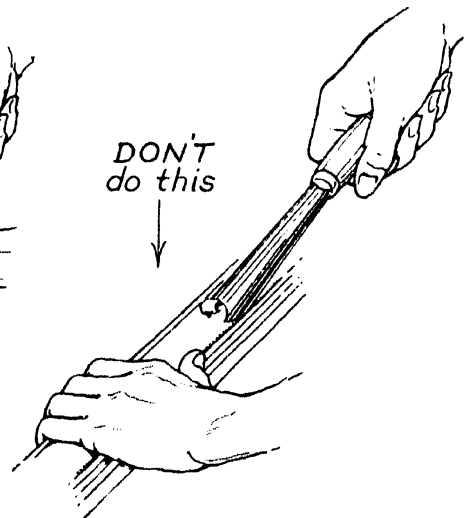
Hold this way



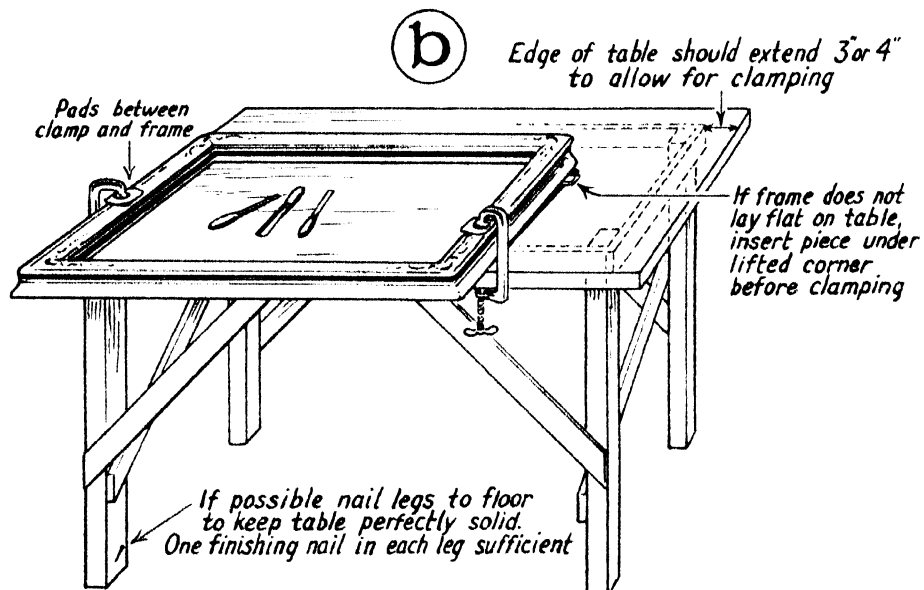
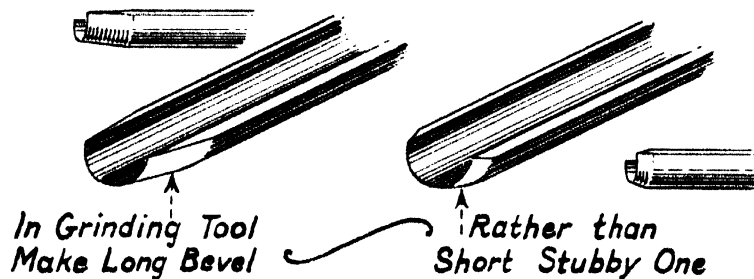
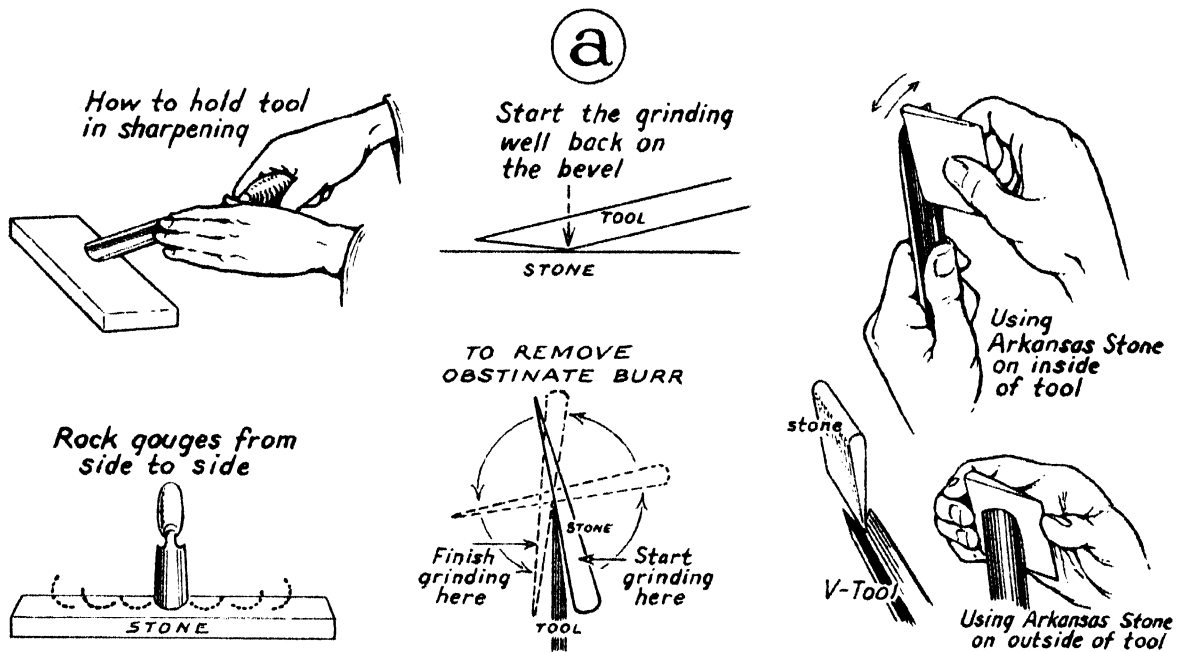
--or this way

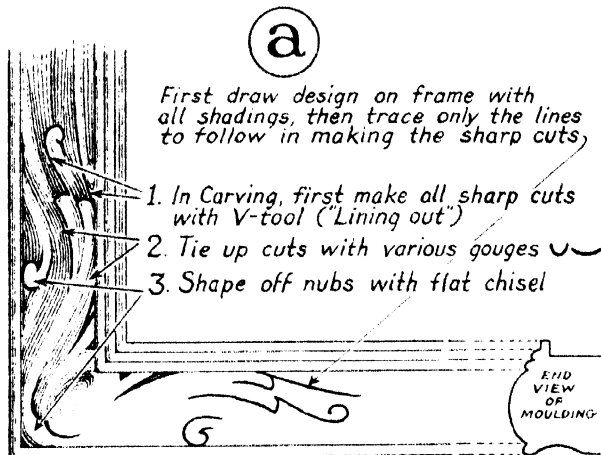


DON'T  
do this

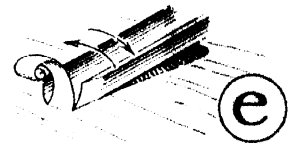
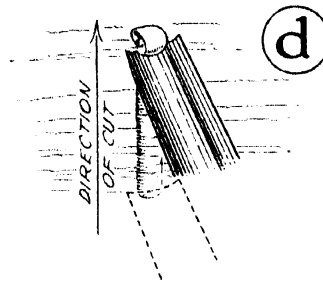


# PLATE 3

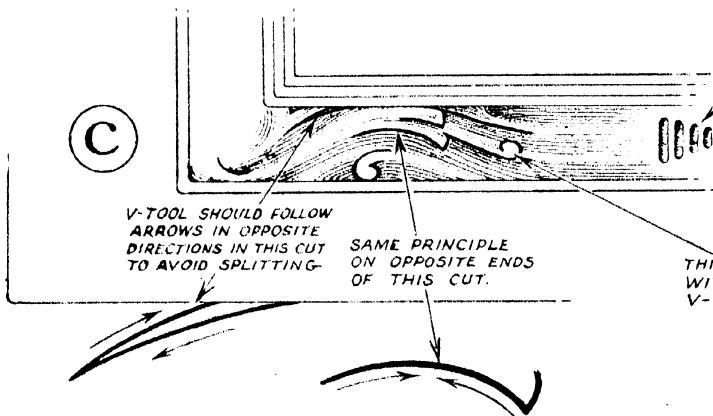




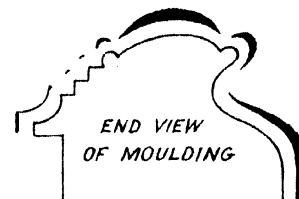
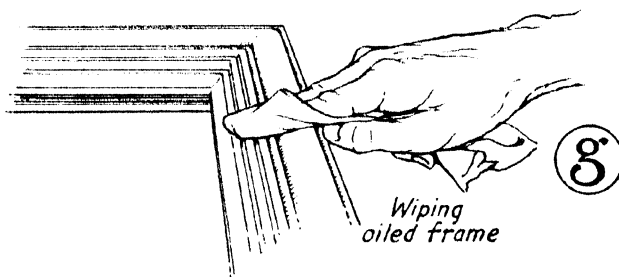
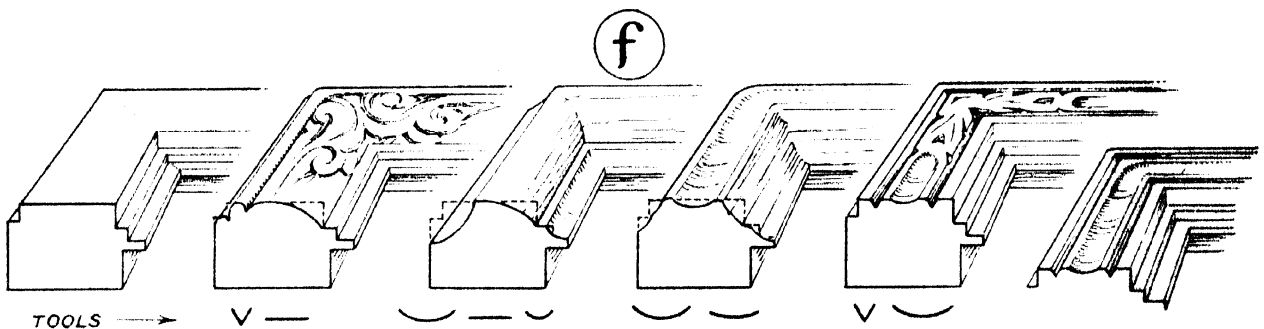
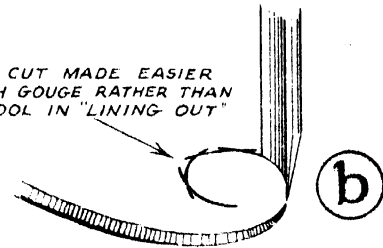
In Cutting directly across grain with SHALLOW gouge, the cutting-edge should be at an angle with the grain rather than parallel.



In cutting directly across grain with DEEP gouge, rock or wiggle tool from side to side.



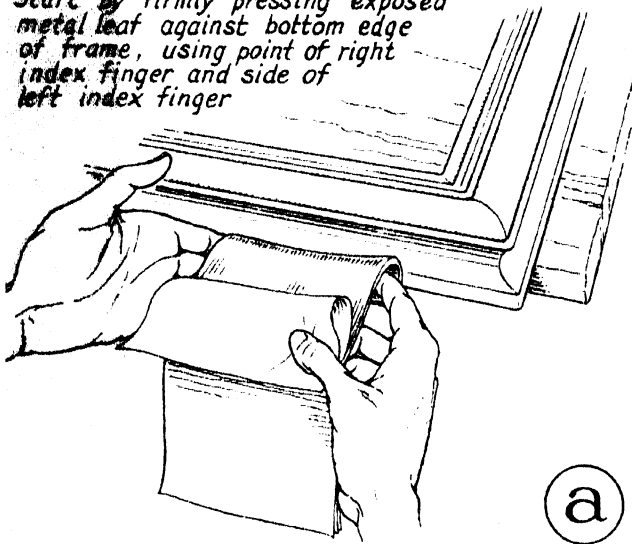
THIS CUT MADE EASIER WITH GOUGE RATHER THAN V-TOL IN "LINING OUT"



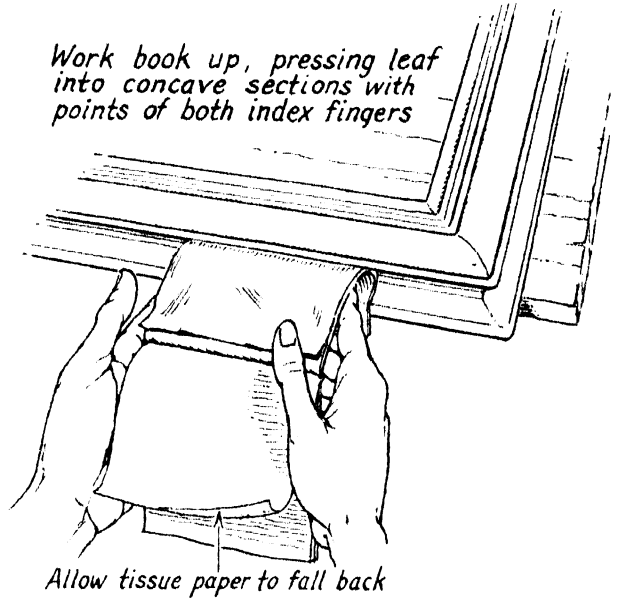
Outside lines indicate where wiping is done and varying pressure exerted on different parts of moulding

# PLATE 5

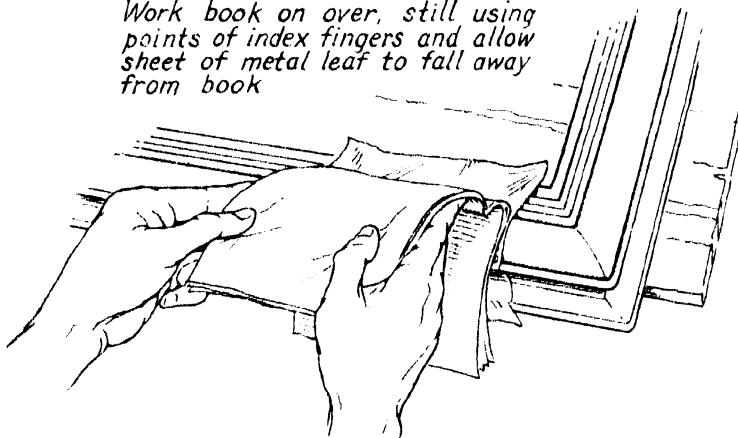
Start by firmly pressing exposed metal leaf against bottom edge of frame, using point of right index finger and side of left index finger



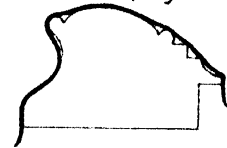
Work book up, pressing leaf into concave sections with points of both index fingers



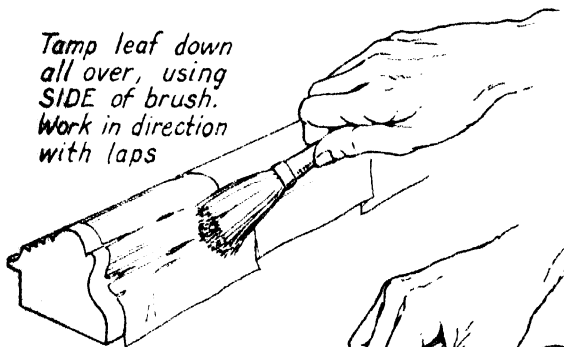
Work book on over, still using points of index fingers and allow sheet of metal leaf to fall away from book



How leaf will lay before tamping down



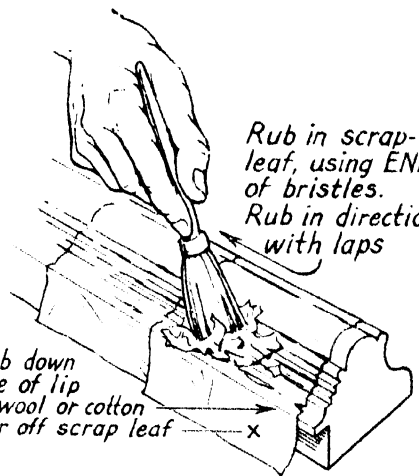
Tamp leaf down all over, using SIDE of brush. Work in direction with laps



(b)

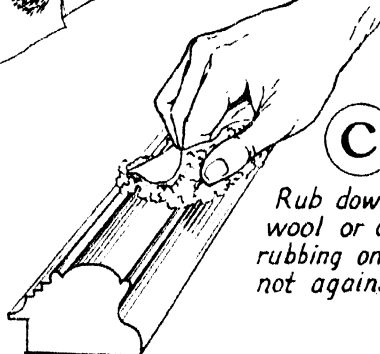
Rub in scrap-leaf, using END of bristles. Rub in direction with laps

Rub down edge of lip with wool or cotton and tear off scrap leaf

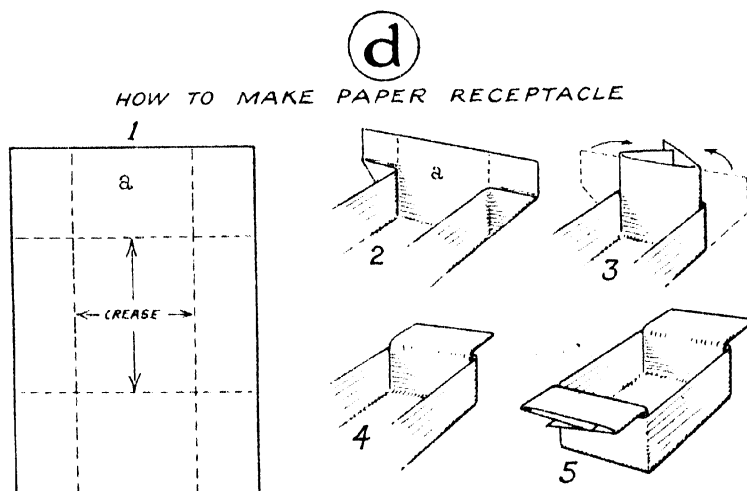
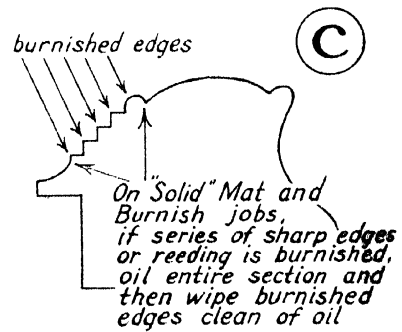
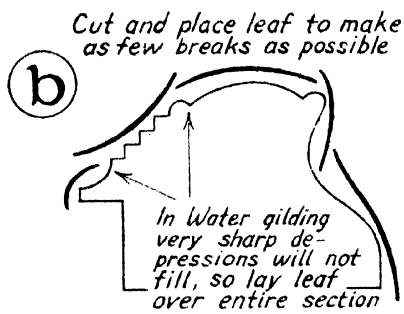
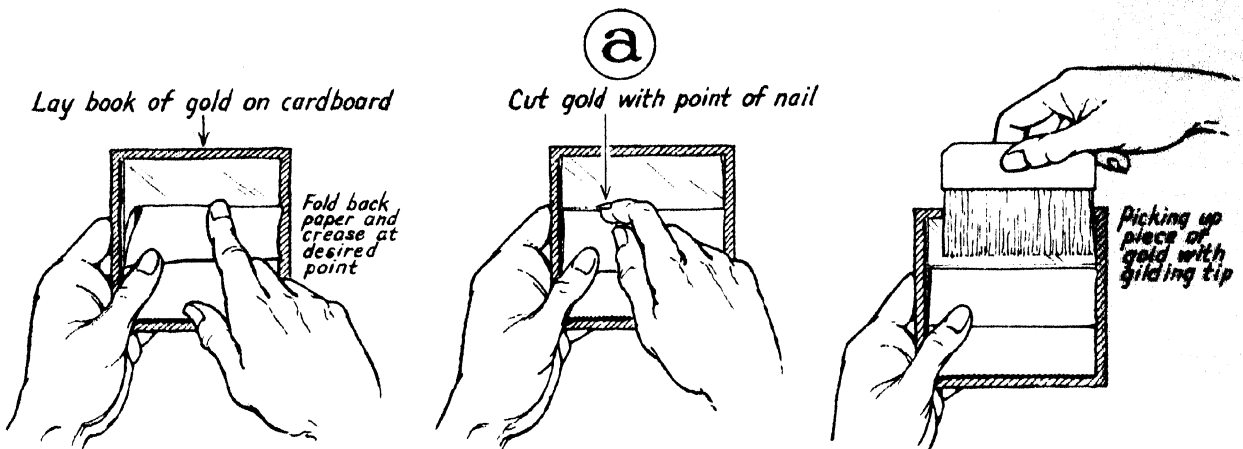


(c)

Rub down with wool or cotton, rubbing only with laps not against laps



# PLATE 6







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